*team*server Guide

Edition 12

FUJITSU COMPUTERS SIEMENS

October 1999

Welcome to Edition 12 of the *team*server Guide

The aim of this document is to help sales, support or customers involved in selling or purchasing servers from the ***team*server** range by providing concise, at a glance technical information. More detailed information is available in the Product Descriptions that are published on the Fujitsu Siemens web site.

Before any offer is made, the proposed configuration should always be validated by ***team*server** Configurer. This is a utility that allows you to specify and price valid system configurations quickly and easily for all servers in the current ***team*server** range.

It is available at http://www.fujitsu-computers.com/partners/Tools/ServerConfig/

If you do not have access to the World Wide Web, please contact your local country support desk to obtain the latest version.

What's New in Edition 12

This publication has been renamed from the Fujitsu Server Guide to the *team*server Guide to reflect the new merged organisation.

- **Pentium III 600MHz processors introduced on *team*server A800*i*** (page 7)
- **Pentium III 600MHz processors introduced on *team*server G800*i*** (page 12)
- **Pentium III Xeon 550MHz processors introduced on *team*server L800*i* and *T*800*i*** (page 14 and 16)
- ***team*server T800*i*** - datacenter server (page 16)
- **Microsoft Cluster Server on C800*i*, G800*i* and L800*i* (LVD Disk Node).** (page 33)
  MSCS is a Microsoft software product that supports the connection of two servers into a 'cluster' for higher availability and easier manageability of data and applications.
- **Microsoft Windows on *team*servers** (page 57)
- **Competitive Information** - for the ***team*server 800 Series** (page 67)

Existing sections have been updated to take account of new features which have become available since Edition 10 of the Server Guide.

Withdrawn Server Products

The ***team*server Guide** references current ***team*servers**. If you want to find out information about withdrawn server products since April 1997, please refer to http://www.fujitsu-computers.com/partners/easyguides/servers/sguide.html

then select "Withdrawn Servers Information"

How do I obtain an electronic version of the *team*server Guide?

Partners need to logon at http://www.fujitsu-computers.com/logon

The documents can then be found at http://www.fujitsu-computers.com/partners/easyguides/servers/sguide.html

To obtain a Partner Logon for the Fujitsu Siemens web site please contact your local administrator or your local country Fujitsu Siemens support desk.

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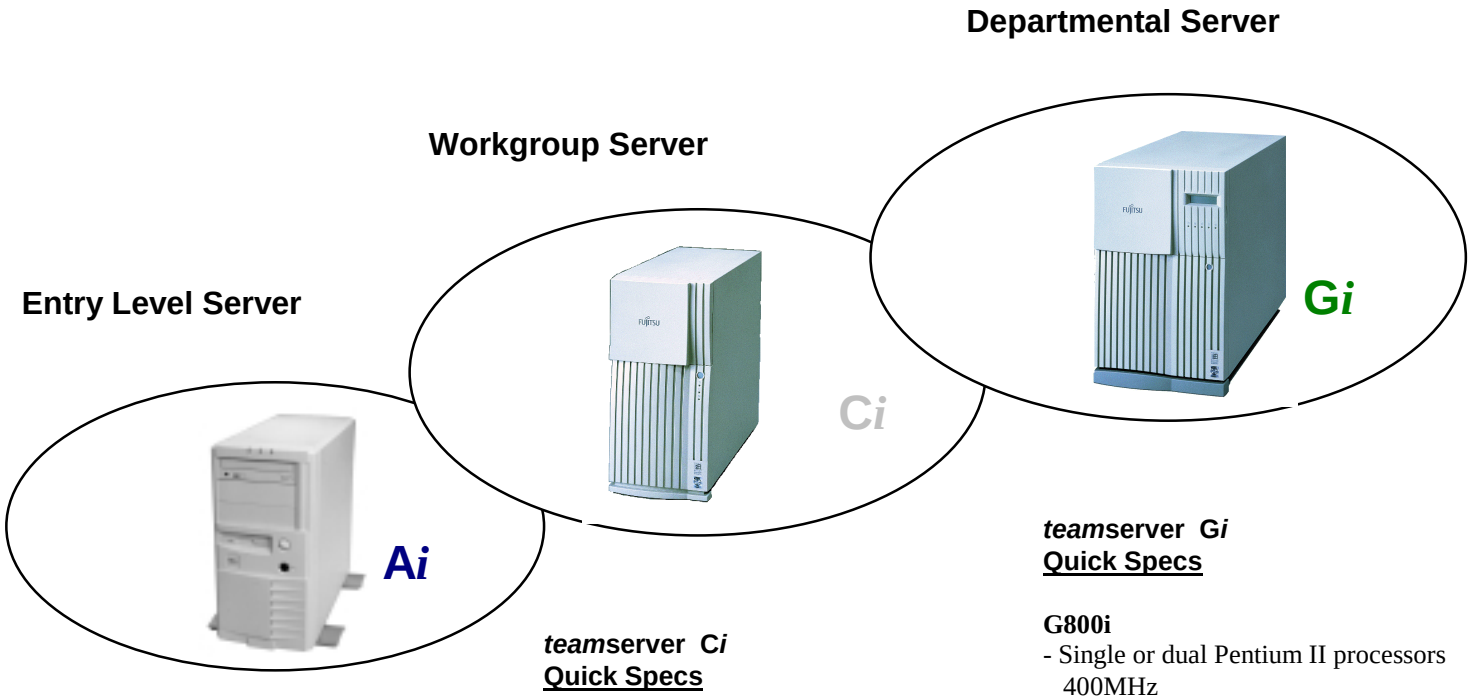
Intel Server Positioning



team*server A*i
Quick Specs

A800i
- Single Pentium II Processor
  400MHz
  with 512KB L2 cache
  100MHz bus speed
- Single Pentium III Processor
  450/500/550/600MHz
  with 512KB L2 cache
  100MHz bus speed
- Up to 3 IDE disk bays max 41.1GB
  3 SCSI disk bays max 54GB
- Up to 1GB ECC SDRAM
- PCI/ISA architecture
- Ethernet on motherboard
- 3 year warranty on site*

Competition

- IBM Netfinity 1000, 3000
- HP NetServer E60
- Compaq ProLiant 400, ProSignia 720
- Dell PowerEdge 1300
- Siemens Primergy 070, 170, 270

team*server C*i
Quick Specs

C800i
- Single or dual Pentium II Processors
  400MHz
  with 512KB L2 cache,
  100MHz bus speed
- Single or dual Pentium III Processors
  450/500/550/600MHz
  with 512KB L2 cache,
  100MHz bus speed
- 5 disk bays, max 90GB
- Hot-swap cage & disks
- 1GB ECC SDRAM
- PCI/ISA architecture
- Ethernet & Ultra-wide SCSI
  on motherboard
- 3 year warranty on site*

Competition

- IBM Netfinity 3500 M10
- HP NetServer LC3, LPr, (E60)
- Compaq ProLiant 1600, 1850R, (800)
- Compaq ProSignia 740
- Dell PowerEdge 1300, (2300)
- Siemens Primergy 470

team*server G*i
Quick Specs

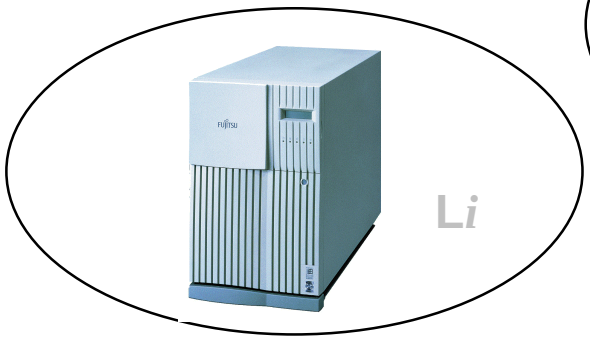
G800i
- Single or dual Pentium II processors
  400MHz
  with 512KB L2 cache,
  100MHz bus speed
- Single or dual Pentium III processors
  450/500/550/600MHz
  with 512KB L2 cache,
  100MHz bus speed
- 8 Hot Pull disk bays, max 252GB
- 2GB ECC SDRAM
- Ethernet & Ultra2/LVD SCSI
  on motherboard
- PCI/ISA architecture
- 3 year warranty on site*

Competition

- IBM Netfinity 5000, 5500
- HP NetServer LH3, LH3r
- Compaq ProLiant 3000, (1600)
- Dell PowerEdge 4300, 4350, (2300)
- Siemens Primergy 470, 670-20

Intel Server Positioning

Enterprise Server



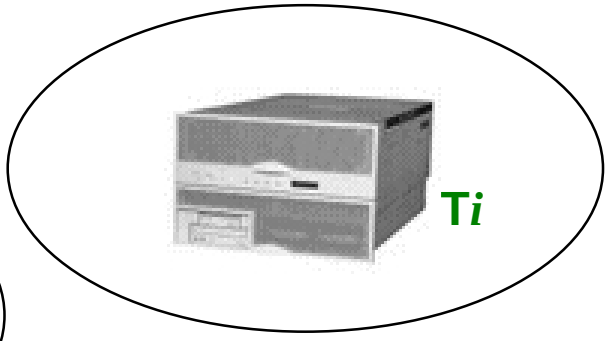
team*server L*i
Quick Specs

L800i
- Single, dual or quad Pentium III Xeon Processors 500/550MHz with 512KB/1MB/2MB L2 cache, 100MHz bus speed
- 8 Hot Pull disk bays, max 252GB
- Up to 4GB ECC EDO
- PCI/ISA architecture
- Ultra2/LVD SCSI on motherboard, 10/100Mbit Ethernet card
- 3 year warranty on site*

Competition

- IBM Netfinity (5500 M10), 5500 M20
- HP NetServer LH4, LH4r
- Compaq ProLiant 5500, 6500, 6400R
- Dell PowerEdge 6300, 6350
- Siemens Primergy 670-40, 870 Edition

Datacenter Server



team*server T*i
Quick Specs

T800i
- Single to 8-way Pentium III Xeon Processors 550MHz with 512KB/1MB/2MB L2 cache, 100MHz bus speed
- 2 Hot Pull disk bays, max 72GB
-Up to 32GB ECC SDRAM
- PCI architecture
- 10/100Mbit Ethernet card
- 3 year warranty on site*

Competition

- IBM Netfinity 8500R
- HP NetServer LXr 8500
- Compaq ProLiant 8000, 8500
- Dell PowerEdge 8450
- Siemens Primergy 870-80

Server Segmentation

Despite the baffling range of servers on the market today, it is possible to separate them into clear categories, each of which meets differing business needs. Many experts would agree on the following:

Entry level: For dedicated everyday workgroup tasks where capital cost is more important than future expandability.

Workgroup: Able to perform workgroup tasks relatively cost effectively but with good scope for expansion and disk resilience.

Departmental: Mainstream, relatively affordable server with very good expansion capability for CPU, memory and I/O, plus excellent resilience features.

Enterprise: Power base server with outstanding expansion of CPU, memory and I/O, plus excellent resilience features.

Datacenter: Top of the range power base server with maximum expandability and resilience, for the most demanding of applications.

However, equally, if not more important is the consideration of applications. For example, small companies, as well as large multi-national conglomerates use web servers. The specification of the server will therefore depend on the number of users and the mission critical nature that the organisation places on the use of the Internet. This may necessitate varying levels of resilience available only on "enterprise" level servers for example.

Server Application Segmentation

The following list provides an outline of the differing levels of server usage.

Infrastructure servers (generic, high volume)

- *File server*
- *Print or Fax server*
- *Terminal Server (MSTS, Citrix)*
- *Web Internet (front-end servers)*
- *Company Intranet server*
- *Data/File transfer server*
- *Directory service server*
- *Name server*
- *Firewall or gateway server*
- *Proxy server*

Workgroup (generic - high volume)

- *Mail and messaging server*
- *Departmental Intranet server*

Replicated application server (customised, high volume)

- *Replicated Branch Office or Site server*
- *Replicated departmental server*

Departmental server (customised - low volume)

- *Application development server*
- *Departmental application/database*
- *Call centre server*

Company application server (customised, - low-volume, often mission critical)

- *E-commerce server*
- *Data Warehouse server*
- *Company OLTP server*
- *Decision support server*
- *ERP server*

*team*server A800*i*

team*server A800*i is a workgroup server utilising a single 400MHz Intel® Pentium® II processor or a single 450MHz, 500MHz, 550MHz or 600MHz Pentium® III processor. The **A800*i*** extends the existing teamserver range to accommodate small to medium-sized businesses with cost-sensitive requirements, whilst still providing the high level of performance and reliability associated with Fujitsu ***team*servers**.

- Intel Pentium II 400MHz CPU with 512kB 2nd level cache or
  Intel Pentium III 450MHz, 500MHz, 550MHz or 600MHz CPU with 512kB 2nd level cache
- High-performance CPU combined with 100MHz System Bus and enhanced I/O subsystem alleviates system bottlenecks to deliver superior end-to-end system performance
- Maximum 41.1GB of IDE or 54GB SCSI disk storage in system cabinet
- Motherboard with 440BX chipset supporting up to 1GB SDRAM memory
- 3 dedicated PCI slots, 1 dedicated ISA slot and 1 shared PCI/ ISA slot
- Fujitsu ***server*manager** providing suite of programs to manage server
- Support for industry-standard operating systems: Microsoft® Windows NT® Server 4.0
  SCO® UnixWare® 7 and Novell® IntranetWare 4.11

Processor	***team*server A820*i*:** Pentium II 400MHz with 512KB integral L2 cache ***team*server A840*ie*:** Pentium III 450MHz with 512KB integral L2 cache ***team*server A870*i*:** Pentium III 500MHz with 512KB integral L2 cache ***team*server A870*ie*:** Pentium III 550MHz with 512KB integral L2 cache ***team*server A870*ix*:** Pentium III 600MHz with 512KB integral L2 cache Intel 440BX Chipset
Memory	1GB ECC SDRAM maximum from 4 DIMM slots (using 4 * 256MB DIMM)
Disks (internal max)	• Maximum 41.1GB with IDE disks (3 * 13.7GB); • Maximum 54GB with SCSI disks (3 * 18GB)
I/O buses	• 3 x dedicated PCI slots • 1 x dedicated ISA slot • 1 shared PCI/ISA slot
On-board I/O subsystems	• 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller integrated onto motherboard
Storage bays	• 3 x 5.25” bays, one occupied by CD-ROM • 4 bays including 2 of the 5.25” bays (for up to 4 SCSI disks or 3 IDE disks) one may already be occupied by the system disk • 1 x FDD bay, occupied by FDD
Storage in standard configuration	• 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
Server Management	Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems.
Graphics as standard	SVGA AGP Graphics Controller with 4MB video RAM (ATi 3D Rage 2C AGP) plugs into a dedicated AGP slot on the motherboard (not upgradeable)
Operating system software	• Microsoft Windows NT Server 4.0 • Novell IntranetWare 4.11 • SCO UnixWare 7
Memory Upgrades	• 64, 128MB and 256MB SDRAM upgrades
Storage Devices	• 4.3GB, 6.4GB, 8.4GB, 10.1GB and 13.7GB IDE hard disk drives • 4GB Ultra-SCSI disk • 9GB and 18GB Ultra2/LVD SCSI disks • 4-8GB DDS-2 4mm internal DAT drive • 12-24GB DDS-3 4mm internal DAT drive • 4-8GB Travan 4 tape drive (supported by NT only)
Network Controllers	• On-board 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller • Intel PRO/100+ Server Adapter
Disk Controllers	• Optional Adaptec AHA2940UW Single Channel S/E PCI Adapter
UPS	• APC (American Power Conversion)
Dimensions & Weight	Height, Width, Depth (410 x 190 x 435mm) Weight: 16Kg
Standard warranty	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

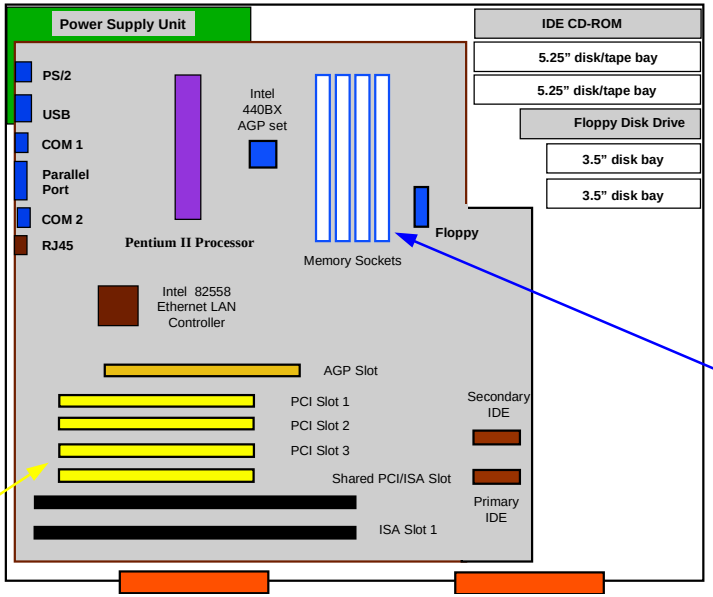
*team*server A820*i*, A840*ie*, A870*i*, A870*ie*, A870*ix* (IDE)

***team*server A800*i* base configurations**	**What to order**
team*server A820*i, 400MHz/512KB Pentium II CPU, IDE, no HDD, 0MB RAM	SV659004 (SV659008)‡
team*server A820*i, 400MHz/512KB Pentium II CPU, IDE, 6.4GB HDD, 64MB RAM	SV659048 (SV659052)‡
team*server A820*i, 400MHz/512KB Pentium II CPU, IDE, 13.7GB HDD, 64MB RAM	SV659049 (SV659053)‡
team*server A840*ie, 450MHz/512KB Pentium III CPU, IDE, no HDD, 0MB RAM	SV659027 (SV659029)‡
team*server A840*ie, 450MHz/512KB Pentium III CPU, IDE, 13.7GB HDD, 128MB RAM	SV659050 (SV659054)‡
team*server A870*i, 500MHz/512KB Pentium III CPU, IDE, no HDD, 0MB RAM	SV659021 (SV659023)‡
team*server A870*i, 500MHz/512KB Pentium III CPU, IDE, 13.7GB HDD, 128MB RAM	SV659051 (SV659055)‡
team*server A870*ie, 550MHz/512KB Pentium III CPU, IDE, no HDD, 0MB RAM	SV659040
team*server A870*ie, 550MHz/512KB Pentium III CPU, IDE, 13.7GB HDD, 128MB RAM	SV659041 (SV659045)‡
team*server A870*ix, 600MHz/512KB Pentium III CPU, IDE, no HDD, 0MB RAM	SV659068
team*server A870*ix, 600MHz/512KB Pentium III CPU, IDE, 13.7GB HDD, 128MB RAM	SV659069 (SV659070)‡

‡ UK server which includes UK keyboard, mouse and power cable.

PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	**What to order**
Intel PRO/100+ Server Adapter (Ethernet)	SV520056
Adaptec AHA2940UW SE SC SCSI adapter (includes internal SCSI cable with 4 connectors)	SV659013

Uninterruptable Power Supply products	**What to order**
UPS Base Package (220-240V)	SV537041
PowerChute software for UnixWare 7	SV537043



Mains Lead Sets	**What to order**
Belgium, Denmark, E.Europe, Finland, France, Fujitsu Spain, Germany, Austria, Holland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland	57495001
Caribean/Asia, India, International, Malaysia/Africa, Middle East, Portuguese Americas, Singapore, South Africa, Spanish Americas, UK	57495002
North America, North East Asia	57495004
Australia/New Zealand, Fiji	Order locally

Internal Backup Device	**What to order**
4-8GB Travan 4 tape drive (Windows NT only)	SV546042
4-8GB DDS-2 4mm DAT tape drive*	SV520009
12-24GB DDS-3 4mm DAT tape drive*	SV546012

* If a DAT drive is used, an Adaptec 2940UW SCSI adapter and cable (SV659013) must be ordered.

Disk Capacity Required	**What to order**
4.3GB IDE	SV659010
6.4GB IDE	SV659011
8.4GB IDE	SV659074
10.1GB IDE	SV659012
13.7GB IDE	SV659039
4 GB 1" 7200rpm 68 pin Ultra-SCSI*	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI*	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI*	SV565067

A maximum of any 3 IDE or 4*4GB SCSI or 4*9GB SCSI or 3*18GB SCSI disks can be installed assuming a tape device has not been configured.
Fitting kits for 5.25" bays supplied and fitted as standard.
* If a SCSI disk is used, an Adaptec 2940UW SCSI adapter and cable (SV659013) must be ordered.

SDRAM	**What to order (Zero or 64MB DIMM as standard)**
64MB	SV578093
128MB	SV578094
256MB	SV659066

Maximum 1GB requires removal of initial 128MB memory if the model selected has 128MB installed.
DIMMs of different sizes may be mixed.

Note:
There are 2 IDE controllers. Each IDE controller can support a maximum of 2 IDE devices. There is a limit of 3 IDE disks because the CD-ROM is an IDE device.
Team*server A800*i is designed and fully supports Windows NT.
UnixWare only supports SCSI backup devices. UnixWare will always install on an IDE disk if there are SCSI and IDE disks. There is no UnixWare limitation for SCSI configurations.
NetWare only supports SCSI backup devices. Use of the 2nd IDE channel is not supported with NetWare so additional disks must be SCSI disks. There is no NetWare limitation for SCSI configurations.

*team*server A820*i*, A840*ie*, A870*i*, A870*ie*, A870*ix* (SCSI)

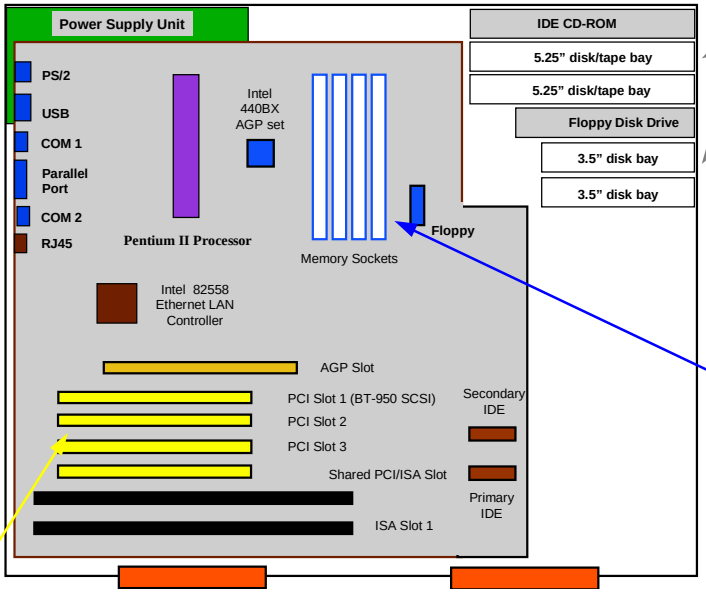
*team*server A800*i* base configurations	What to order
team*server A820*i, 400MHz/512KB Pentium II CPU, SCSI, no HDD, 0MB RAM	SV659032
team*server A820*i, 400MHz/512KB Pentium II CPU, SCSI, 4GB HDD, 64MB RAM	SV659056 (SV659059)‡
team*server A820*i, 400MHz/512KB Pentium II CPU, SCSI, 9GB HDD, 128MB RAM	SV659033 (SV659060)‡
team*server A840*ie, 450MHz/512KB Pentium III CPU, SCSI, no HDD, 0MB RAM	SV659034
team*server A840*ie, 450MHz/512KB Pentium III CPU, SCSI, 4GB HDD, 64MB RAM	SV659057 (SV659061)‡
team*server A840*ie, 450MHz/512KB Pentium III CPU, SCSI, 9GB HDD, 128MB RAM	SV659035 (SV659062)‡
team*server A870*i, 500MHz/512KB Pentium III CPU, SCSI, no HDD, 0MB RAM	SV659036
team*server A870*i, 500MHz/512KB Pentium III CPU, SCSI, 4GB HDD, 64MB RAM	SV659058 (SV659063)‡
team*server A870*i, 500MHz/512KB Pentium III CPU, SCSI, 9GB HDD, 128MB RAM	SV659037 (SV659064)‡
team*server A870*ie, 550MHz/512KB Pentium III CPU, SCSI, no HDD, 0MB RAM	SV659042
team*server A870*ie, 550MHz/512KB Pentium III CPU, SCSI, 9GB HDD, 128MB RAM	SV659043 (SV659046)‡
team*server A870*ie, 550MHz/512KB Pentium III CPU, SCSI, 18GB HDD, 128MB RAM	SV659044 (SV659047)‡
team*server A870*ix, 600MHz/512KB Pentium III CPU, SCSI, no HDD, 0MB RAM	SV659071
team*server A870*ix, 600MHz/512KB Pentium III CPU, SCSI, 9GB HDD, 128MB RAM	SV659072 (SV659073)‡

The SCSI adapter used in these servers is the Mylex Flashpoint BT-950.

PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	What to order
Intel PRO/100+ Server Adapter (Ethernet)	SV520056

Uninterruptable Power Supply products	What to order
UPS Base Package (220-240V)	SV537041
PowerChute software for UnixWare 7	SV537043

Internal Backup Device	What to order
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012



Disk Capacity Required	What to order
4 GB 1" 7200rpm 68 pin Ultra-SCSI	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565067

A maximum of 4*4GB SCSI or 4*9GB SCSI or 3*18GB SCSI disks can be installed assuming a tape device has not been configured.
Fitting kits for 5.25" bays supplied and fitted as standard.

SDRAM	What to order (Zero or 64MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV659066

Maximum 1GB requires removal of initial 128MB memory if the model selected has 128MB installed.
DIMMs of different sizes may be mixed.

Mains Lead Sets	What to order
Belgium, Denmark, E.Europe, Finland, France, Fujitsu Spain, Germany, Austria, Holland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland	57495001
Caribean/Asia, India, International, Malaysia/Africa, Middle East, Portuguese Americas, Singapore, South Africa, Spanish Americas, UK	57495002
North America, North East Asia	57495004
Australia/New Zealand, Fiji	Order locally

Note:
The SCSI controller is a Mylex BT-950 adapter.
The IDE controller on the SCSI based ***team*server A800*i*** is only for driving the CD-ROM and cannot be used to support IDE disk or tape devices.

*team*server C800*i*

The ***team*server C800*i*** range are workgroup servers utilising the latest Pentium II and Pentium III processor technology from Intel. They replace the ***team*server C700*i*** range for small to medium-sized work-groups and offer even greater performance, flexibility and room for expansion.

- **Pentium II 400MHz processor or Pentium III 450MHz, 500MHz, 550MHz processors, upgradeable from single to dual processor operation**
- **100MHz Front Side System Bus**
- **I_2O-ready Architecture**
- **Dedicated AGP slot and graphics card**
- **Hot-swap disk capability**
- **Intel 440BX chipset, offering up to 1GB ECC memory**
- **Rack-mount capability via fitting kit**

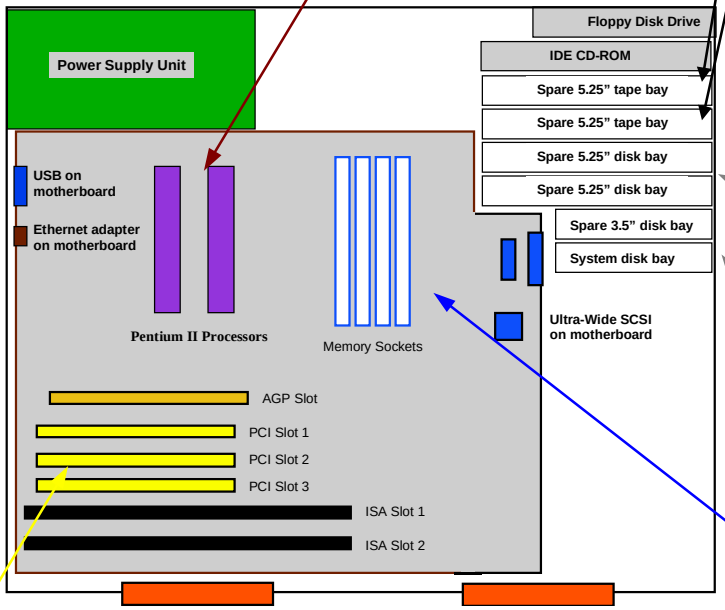
■ **Processor**	• ***team*server C820*i*:** Pentium II 400 MHz with 512KB integral L2 cache • ***team*server C840*ie*:** Pentium III 450 MHz with 512KB integral L2 cache • ***team*server C870*i*:** Pentium III 500 MHz with 512KB integral L2 cache • ***team*server C870*ie*:** Pentium III 550 MHz with 512KB integral L2 cache Intel 440BX Chipset
■ **Memory**	1GB ECC SDRAM maximum from 4 DIMM slots (amount accessed depends on OS)
■ **Disks (internal max)**	• 4 x 68-pin Ultra-SCSI disks or 5 x 68-pin Ultra2/LVD SCSI disks or • 3 x SCA Ultra2/LVD SCSI hot-swap disks and 2 x 68-pin Ultra-SCSI disks
■ **I/O buses**	Dual bus PCI/ISA architecture • 3 x dedicated PCI slots • 2 x dedicated ISA slots • 1 x AGP graphics slot
■ **On-board I/O subsystems**	• Symbios Single-Ended Ultra SCSI controller for Internal Connection, integrated onto motherboard. Communicates with system via PCI bus • 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller integrated onto motherboard • I_2O-ready architecture
■ **Storage bays**	• 3 x 5¼ inch format, half height exchangeable device bays (one occupied by a CD-ROM drive fitted as standard) • 1 x 3½ inch format, 1 inch height device bay (occupied by a diskette drive) • 2 x 5¼ inch and 2 x 3½ inch format, half-height internal device bays
■ **Storage in standard configuration**	• 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
■ **Server Management**	Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems. • Server Manager Assist card for out of band access
■ **Graphics as standard**	SVGA AGP graphics controller (ATi 3D Rage 2C AGP, 4MB DRAM) plugs into a dedicated AGP slot on the motherboard
■ **Operating system software**	• Microsoft Windows NT Server 4.0 • SCO UnixWare 7 * • Novell IntranetWare 4.11 * * Additional SMP licences may be needed for multi-processor systems.
■ **Memory Upgrades**	• 64, 128 and 256MB SDRAM upgrades
■ **Storage Devices**	• 4GB 1" 68 pin 7200rpm Ultra-SCSI hard disk drive (system) • 9GB and 18GB 1" 68 pin 7200rpm Ultra2/LVD hard disk drives (system) • 4GB, 9GB and 18GB 1" SCA 7200rpm Ultra2/LVD hard disk drives (optional hot-swap) • 4-8GB DDS-2 and 12-24GB DDS-3 4mm internal DAT drives • 60-120GB DDS-3 4mm external DAT Stacker • 20-40GB DLT4000 internal and external tape drives • 35-70GB DLT7000 external tape drive • 4-8GB SLR5 QIC internal tape drive
■ **Network Controllers**	• On-board 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller • Intel EtherExpress PRO/10+ PCI adapter and Intel PRO/100+ Server Adapter
■ **Disk Controllers**	• Adaptec AHA2940UW Single-Channel Single-Ended PCI SCSI Adapter • AcceleRAID 250 Ultra2 SCSI PCI RAID Adapter
■ **UPS**	• APC (American Power Conversion)
■ **Dimensions & Weight**	Height, Width (exc. Feet), Depth (440 x 218 x 500mm) Weight: 12kg
■ **Standard warranty**	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

*team*server C820*i*, C840*ie*, C870*i* and C870*ie*

*team*server C800*i* configurations	What to order
***team*server C820*i* /Z**, 400MHz/512KB Pentium II CPU, no HDD, no RAM	SV578156
***team*server C820*i* /B**, 400MHz/512KB Pentium II CPU, no HDD, 64MB RAM	SV578084 (SV578090)‡
***team*server C820*i* /E**, 400MHz/512KB Pentium II CPU, 4GB HDD, 64MB RAM	SV578085 (SV578091)‡
***team*server C820*i* /P**, 400MHz/512KB Pentium II CPU, 9GB HDD, 128MB RAM	SV578086 (SV578092)‡
***team*server C840*ie*/Z**, 450MHz/512KB Pentium III CPU, no HDD, no RAM	SV578176
***team*server C840*ie*/E**, 450MHz/512KB Pentium III CPU, 4GB HDD, 64MB RAM	SV578194 (SV578197)‡
***team*server C840*ie* /P**, 450MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578177 (SV578178)‡
***team*server C870*i* /Z**, 500MHz/512KB Pentium III CPU, no HDD, no RAM	SV578164
***team*server C870*i* /E**, 500MHz/512KB Pentium III CPU, 4GB HDD, 128MB RAM	SV578196 (SV578199)‡
***team*server C870*i* /P**, 500MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578165 (SV578166)‡
***team*server C870*ie* /Z**, 550MHz/512KB Pentium III CPU, no HDD, no RAM	SV578186
***team*server C870*ie* /B**, 550MHz/512KB Pentium III CPU, 4GB HDD, 128MB RAM	SV578187 (SV578189)‡
***team*server C870*ie* /E**, 550MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578188 (SV578190)‡

‡ UK server which includes UK keyboard, mouse and power cable. There are no UK versions of the **C8x0*i*Z** models because these "zero config" servers are intended to be minimal configurations.

Dual Processor Upgrades	What to order
team*server C800*i 400MHz/512KB Pentium II CPU	SV578078
team*server C800*i 450MHz/512KB Pentium III CPU	SV578179
team*server C800*i 500MHz/512KB Pentium III CPU	SV578172
team*server C800*i 550MHz/512KB Pentium III CPU	SV578192



Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive (CMT compatible)	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive	SV546006
35-70GB DLT7000 tape drive	SV546037
60-120GB DDS-3 4mm DAT Stacker	SV546038

Hot-swap Disk Options (Maximum of 3 SCA & one 3.5" disks)	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
Hot-swap Cage – can accommodate up to 3 hot-swap SCA disks (includes 3 disk carriers)	SV578097

Fixed Disk Options (Maximum of 4 Ultra or 5 Ultra2 3.5" disks)	What to order
4 GB 1" 7200rpm 68 pin Ultra-SCSI	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565067
Up to two 3.5" disks can be installed in the 5.25" disk bays if the hot-swap cage is not used. One of the tape bays can also be used for one Ultra2/LVD 68-pin disk.	

PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Eicon P92 dual-port WAN Adapter (UnixWare only)	SV630002
FDDI PCI Adapter: Dual-Attach Station (DAS SK5544)	SV631002
Olicom 16/4 Token Ring card (OC3140)	SV520058
Adaptec AHA2940UW SE SC SCSI adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
SXPCI 32-port PCI Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port PCI Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Mylex AcceleRAID 250 Ultra2 SCSI RAID adapter (8MB) (To be used with SCA disks & Hot-swap Cage)	SV521033

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
UPS Base Package (220-240V)	SV537001
PowerChute software for UnixWare 7	SV537043

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

* Maximum of 1GB requires removal of initial 64MB or 128MB ECC Memory. DIMMs of different sizes may be mixed.

*team*server C800*i* Options	What to order
Server Manager Assist for **C800*i***	SV000142

RAID note: the SCSI cable provided with the server can be used when configuring the Mylex RAID cards. For RAID 5 configurations it is recommended that the disks are all of the same capacity. e.g. All 4GB or 9GB disks.

Mains Lead Sets	What to order
Belgium, Denmark, E.Europe, Finland, France, Fujitsu Spain, Germany, Austria, Holland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland	57495001
Caribean/Asia, India, International, Malaysia/Africa, Middle East, Portuguese Americas, Singapore, South Africa, Spanish Americas, UK	57495002
North America, North East Asia	57495004
Australia/New Zealand, Fiji	Order locally

*team*server G800*i*

The ***team*server G800*i*** range are departmental servers utilising Pentium II and Pentium III processor technology from Intel. They replace the current ***team*server G700*i*** range, offering even greater performance, flexibility and room for expansion.

- **Pentium II 400MHz processors or Pentium III 450MHz, 500MHz, 550MHz and 600MHz processors, upgradeable from single to dual processor operation**
- **100MHz Front Side System Bus**
- **4 dedicated PCI slots (2 hot-swap)**
- **Hot-swap power supply & hot-swap fans**
- **Hot-swap disk, max of 252GB in system cabinet**
- **Intel 440GX chipset, offering up to 2GB ECC memory**
- **Rack-mount capability**

■ **Processor**	• ***team*server G820*i:*** Pentium II 400 MHz with 512KB integral L2 cache • ***team*server G840*ie:*** Pentium III 450 MHz with 512KB integral L2 cache • ***team*server G870*i:*** Pentium III 500 MHz with 512KB integral L2 cache • ***team*server G870*ie:*** Pentium III 550 MHz with 512KB integral L2 cache • ***team*server G870*ix:*** Pentium III 600 MHz with 512KB integral L2 cache Intel 440GX Chipset
■ **Memory**	2GB ECC SDRAM maximum from 4 DIMM slots (amount accessed depends on OS)
■ **Disks (internal max)**	Eight disks maximum: • 8 x 4GB or 9GB or 18GB 1" SCA Ultra2/LVD SCSI disks or • 6 x 36GB 1.6" and 2 x 4GB or 9GB or 18GB 1" SCA Ultra2/LVD SCSI disks • Maximum storage is 252GB from 6 x 36GB 1.6" disks and 2 x 18GB 1" disks
■ **I/O buses**	Dual bus PCI/ISA architecture • 4 x dedicated PCI slots (2 slots are hot-swap PCI if the operating system and PCI card driver support this feature) • 1 x dedicated ISA slot • 1 x shared PCI/ISA slot
■ **On-board I/O subsystems**	• Dual PCI Ultra2/LVD Symbios SYM53C895 SCSI controller integrated onto motherboard. (Symbios SYM53C141 integrated controller enables tape devices to run single ended without degrading performance of the Ultra2/LVD Symbios SYM53C895). • 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller integrated onto motherboard • I_2O-ready architecture
■ **Storage bays**	• 4 x 5¼- inch format half-height exchangeable device bays, two bays occupied with a CD-ROM drive and a horizontally mounted 3½ inch diskette drive fitted as standard • 8 x 3½-inch format hot-swap capable disk bays (6 bays can take disks which are 1" or 1.6" high; the other 2 bays can only take 1" disks)
■ **Storage in standard configuration**	• 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
■ **Server Management**	Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems. • Server Manager Assist card for out of band access
■ **Graphics as standard**	Integrated SVGA ATi 3D RAGE IIC PCI controller with 2MB video DRAM
■ **Operating system software**	• Microsoft Windows NT Server 4.0 • SCO UnixWare 7.1 *, OpenServer 5.0.5 • Novell IntranetWare 4.11 *, NetWare 5 * * Additional SMP licences may be needed for multi-processor systems.
■ **Memory Upgrades**	• 64, 128 and 256MB SDRAM upgrades
■ **Storage Devices**	• 4GB 1", 9GB 1" and 18GB 1" SCA 7200rpm Ultra2/LVD SCSI hard disk drives • 9GB 1", 18GB 1" and 36GB 1.6" SCA 10000rpm Ultra2/LVD SCSI hard disk drives • 4-8GB DDS-2 and 12-24GB DDS-3 4mm internal DAT drives • 60-120GB DDS-3 4mm external DAT Stacker • 20-40GB DLT4000 internal and external tape drives • 35-70GB DLT7000 external tape drive, 4-8GB SLR5 QIC internal tape drive
■ **Network Controllers**	• On-board 10/100 Mbps UTP PCI wake-on LAN Intel 82558 Ethernet controller • Intel EtherExpress PRO/10+ PCI adapter and Intel PRO/100+ Server Adapter
■ **Disk Controllers**	• Adaptec AHA2940UW Single-Channel Single-Ended PCI SCSI Adapter • eXtremeRAID 1100 Ultra2 SCSI PCI RAID Adapters
■ **UPS**	• APC (American Power Conversion)
■ **PSU**	• Ability to upgrade configuration with additional PSUs to enable Hot-swap capability. • One PSU fitted as standard. For redundancy an additional PSU is required.
■ **Dimensions & Weight**	Height, Width (exc. Feet), Depth (474 x 307 x 700mm) Weight: 50kg (max)
■ **Standard warranty**	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

*team*server G820*i*, G840*ie*, G870*i*, G870*ie* and G870*ix*

*team*server G800*i* configurations	What to order
***team*server G820*i* /Z**, 400MHz/512KB Pentium II CPU, LVD, no HDD, no RAM	SV661008
***team*server G820*i* /B**, 400MHz/512KB Pentium II CPU, LVD, no HDD, 64MB RAM	SV661009 (SV661012)‡
***team*server G820*i* /P**, 400MHz/512KB Pentium II CPU, LVD, 9GB HDD, 128MB RAM	SV661011 (SV661014)‡
***team*server G840*ie* /Z**, 450MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661015
***team*server G840*ie* /P**, 450MHz/512KB Pentium III CPU, LVD, 9GB HDD, 128MB RAM	SV661018 (SV661021)‡
***team*server G870*i* /Z**, 500MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV578167
***team*server G870*i* /P**, 500MHz/512KB Pentium III CPU, LVD, 9GB HDD, 128MB RAM	SV578168 (SV578169)‡
***team*server G870*ie* /Z**, 550MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661039
***team*server G870*ie* /E**, 550MHz/512KB Pentium III CPU, LVD, 9GB HDD, 128MB RAM	SV661041 (SV661042)‡
***team*server G870*ix* /Z**, 600MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661049
***team*server G870*ix* /E**, 600MHz/512KB Pentium III CPU, LVD, 9GB HDD, 128MB RAM	SV661050 (SV661052)‡

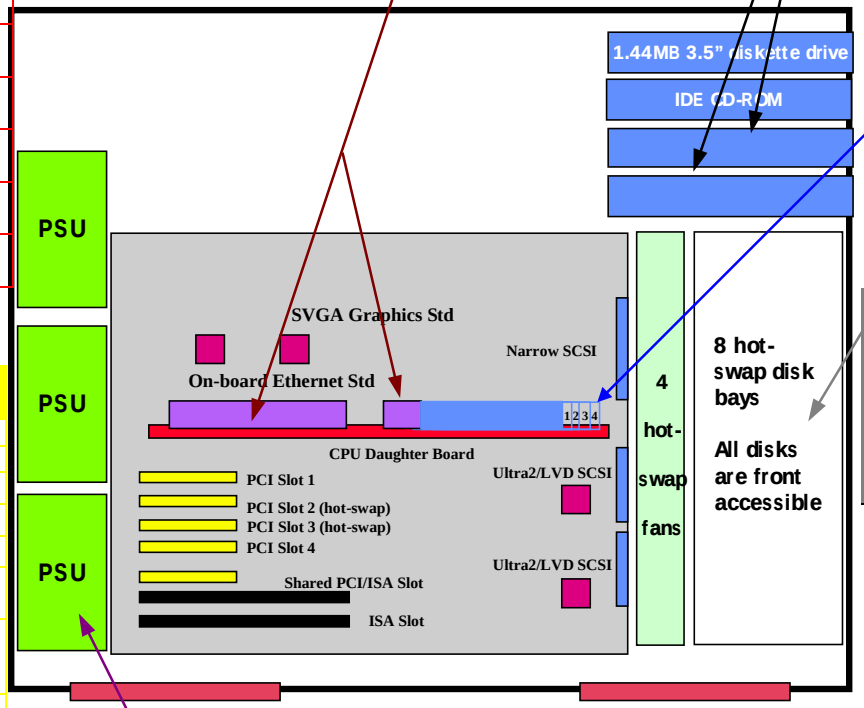
‡ UK server which includes UK keyboard, mouse and power cable.
There are no UK versions of the **G8x0*i*/Z** models because these "zero config" servers are intended to be minimal configurations.

PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Eicon P92 dual-port WAN Adapter (UnixWare only)	SV630002
FDDI PCI Adapter: Dual-Attach Station (DAS SK5544)	SV631002
Olicom 16/4 Token Ring card (OC3140)	SV520058
Adaptec AHA2940UW SE SC SCSI adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
SXPCI 32-port PCI Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port PCI Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery)	SV521036

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
UPS Base Package (220-240V)	SV537003
PowerChute software for UnixWare 7	SV537043

Dual Processor Upgrades	What to order
team*server G800*i 400MHz Pentium II Upgrade	SV578078
team*server G800*i 450MHz Pentium III Upgrade	SV578179
team*server G800*i 500MHz Pentium III Upgrade	SV578172
team*server G800*i 550MHz Pentium III Upgrade	SV578192
team*server G800*i 600MHz Pentium III Upgrade	SV578215



*team*server G800*i* Options	What to order
Additional PSU for **G800*i***	SV578111
Hot-Swap Replacement Fan	SV578113
Server Manager Assist for **G800*i***	SV000147
External SCSI connection for ext. tape	SV521037

Server is supplied with 1 PSU.
For hot-swap redundancy, an additional PSU is required.
Each PSU requires a separately orderable mains cable.

Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive	SV546006
35-70GB DLT7000 tape drive	SV546037
60-120GB DDS-3 4mm DAT Stacker	SV546038

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095
512MB	SV578180

* Maximum of 1GB requires removal of initial 64MB or 128MB ECC Memory.
DIMMs of different sizes may be mixed.
Note: 512MB upgrade not available on non-Ultra2/LVD models (SV578098 – SV578154)

Disk Capacity Required	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum of 252GB disk in system cabinet from 6 x 36GB and 2 x 18GB disks.
For RAID systems, order PCI RAID Card SV521032 or SV521036. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity. E.g. All 4GB, 9GB, 18GB or 36GB disks.

Mains Lead Sets	What to order
European	57495001
UK, Asia	57495002
United States	57495004
Australia, Fiji, New Zealand	Sourced locally

*team*server L800*i*

The ***team*server L800*i*** range are enterprise level servers utilising the latest Pentium III Xeon™ processor technology from Intel. Targeted at the consolidated LAN server market for high performance enterprise applications, **L800*i*** offers fast, reliable performance, flexibility and ample headroom for growth.

- **High-performance Pentium III Xeon 500MHz processors with 512KB or 1MB L2 cache and Pentium III Xeon 550MHz processors with 512KB, 1MB or 2MB L2 cache at full core speed**
- **I_2O-ready Architecture**
- **Hot-swap redundant Power Supply Units & Fans**
- **Rack-mount capability**
- **Hot-swap disk, max of 252GB in system cabinet**
- **ECC EDO RAM, up to 4GB**
- **Upgradeable to quad processing**

■ **Processor**	• ***team*server L870*i*:** Pentium III Xeon 500MHz with 512KB integral L2 cache • ***team*server L880*i*:** Pentium III Xeon 500MHz with 1MB integral L2 cache • ***team*server L870*ie*:** Pentium III Xeon 550MHz with 512KB integral L2 cache • ***team*server L880*ie*:** Pentium III Xeon 550MHz with 1MB integral L2 cache • ***team*server L890*ie*:** Pentium III Xeon 550MHz with 2MB integral L2 cache Upgradeable to dual or quad processing. Intel 450NX Chipset.
■ **Memory**	4GB 100MHz ECC EDO RAM maximum from 16 DIMM slots (four way interleaved)
■ **Disks (internal max)**	Eight disks maximum: • 8 x 4GB or 9GB 1" or 18GB 1" SCA Ultra2/LVD SCSI disks or • 6 x 36GB 1.6" and 2 x 9GB or 18GB 1" SCA Ultra2/LVD SCSI disks • Maximum storage is 252GB from 6 x 36GB 1.6" disks and 2 x 18GB 1" disks
■ **I/O buses**	• 5 x dedicated PCI slots • 1 x shared PCI/ISA slot (full length PCI or half length ISA) NB: this is not physically shared, use of one slot prevents use of the other. • 1 x half length PCI slot (occupied by Intel PRO/100+ Management Adapter)
■ **On-board I/O subsystems**	• Dual channel PCI Ultra2/LVD Symbios SYM53C896 SCSI controller integrated on motherboard • Single channel Symbios SYM53C810AE SCSI controller integrated onto motherboard. • I_2O-ready architecture
■ **Storage bays**	• 4 x 5¼- inch format half-height exchangeable device bays, two bays occupied with a CD-ROM drive and a horizontally mounted 3½ inch diskette drive fitted as standard • 8 x 3½-inch format hot-swap capable disk bays (6 bays can take disks which are 1" or 1.6" high; the other 2 bays can only take 1" disks)
■ **Storage in standard configuration**	• 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
■ **Server Management**	Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems.
■ **Graphics as standard**	• Integrated SVGA Cirrus Logic CL-GD5480 PCI graphics controller with 2MB video RAM
■ **Operating system software**	• Windows NT Server 4.0 • SCO UnixWare 7 .1 * • IntranetWare 4.11 *, NetWare 5 * * Additional SMP licences may be needed for multi-processor systems.
■ **Memory Upgrades**	• 128, 256, 512 and 1024MB ECC EDO RAM upgrades
■ **Storage Devices**	• 4GB 1", 9GB 1" and 18GB 1.6" SCA 7200rpm Ultra2/LVD SCSI hot-swap disk drives • 9GB 1", 18GB 1" and 36GB 1.6" SCA 10,000rpm Ultra2/LVD SCSI hot-swap disk drives • 4-8GB DDS-2 and 12-24GB DDS-3 4mm internal DAT drives • 20-40GB DLT4000 internal and external tape drives • 35-70GB DLT7000 external tape drive, 4-8GB SLR5 QIC internal tape drive • 60-120GB DDS-3 4mm external DAT Stacker, 280-560GB DLT7000 Autoloader
■ **Network Controllers**	• Intel PRO/100+ Management Adapter as standard • Intel EtherExpress PRO/10+ PCI and PRO/1000 Gigabit Ethernet adapters • Intel PRO/100+ Server Adapter • Olicom Token-Ring PCI 16/4 Adapter (OC-3140) • P92 PCI Adapter: dual port WAN Adapter • FDDI PCI Adapter: Dual-Attach Station (DAS) (SK5544) • SXPCI Async Host Adapter • Specialix High Connectivity RIO RS-232 Asynchronous Adapter • Intel Server Management Module
■ **Disk Controllers**	• Adaptec AHA2940UW Single-Channel Single-Ended PCI SCSI Adapter • Adaptec AHA2944UW Single-Channel Differential PCI SCSI Adapter • eXtremeRAID 1100 Ultra2 SCSI PCI RAID Adapters
■ **UPS**	• 1.4kVA and 2.2kVA UPS from APC (American Power Conversion)
■ **PSU**	• Two PSUs supplied as standard, an additional PSU is required for hot-swap redundancy
■ **Dimensions & Weight**	Height, Width (exc. Feet), Depth (474 x 307 x 700mm), Weight: 55kg (max)
■ **Standard warranty**	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

*team*server L870*i*, L880*i*, L870*ie*, L880*ie* and L890*ie*

*team*server L800*i* base configurations	What to order
team*server L870*i, 500MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656063
team*server L870*i, 500MHz/512KB Pentium III Xeon CPU, no HDD, 128MB RAM	SV656066 (SV656065)‡
team*server L880*i, 500MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656064
team*server L880*i, 500MHz/1MB Pentium III Xeon CPU, no HDD, 128MB RAM	SV656067 (SV656068)‡
team*server L870*ie, 550MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656085
team*server L880*ie, 550MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656086
team*server L890*ie, 550MHz/2MB Pentium III Xeon CPU, no HDD, no RAM	SV656091

System pre-installed with Intel PRO/100+ Management Adapter
‡ UK server which includes UK keyboard, mouse and two power cables.
There are no UK versions of the **L8x0*i*Z** models because these "zero config" servers are intended to be minimal configu.rations

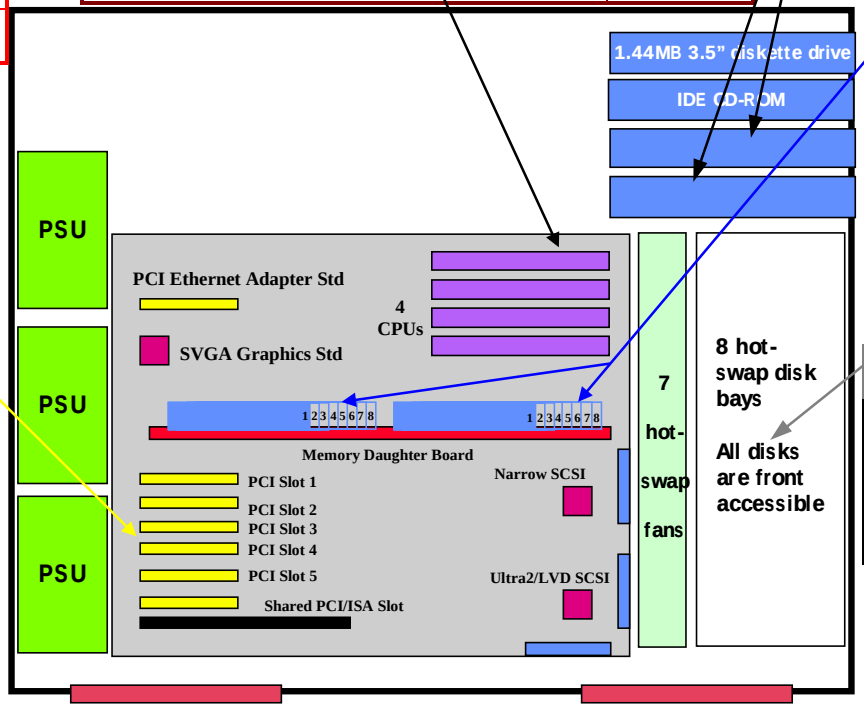
CPU note: 1½ voltage regulators required per processor, 6 voltage regulators are available.
SVGA note: Cirrus Logic CL-GD5480 with 2MB VRAM, is not upgradeable.

PCI I/O Adapters (Intel PRO/100+ Management Adapter as standard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Intel PRO/1000 Gigabit Ethernet Server Adapter*	SV520059
Adaptec AHA2940UW SE SC SCSI Adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
Adaptec AHA2944UW Differential SCSI Adapter	SV521016
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery)	SV521036
SXPCI 32-bit Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-bit Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Olicom Token-Ring 16/4 Adapter (OC3140)	SV520058
P92 dual-port WAN Adapter* V.24 cable for P92 WAN Adapter X.21 cable for P92 WAN Adapter	SV630002 SV630003 SV630004
FDDI Adapter: Dual Attach Station (DAS) (SK5544)*	SV631002

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
1.4kVA UPS Base Package (220-240V) UPS-to-server power cables (pack of two)	SV537005 SV537040
2.2kVA UPS Base Package (220-240V) Mains Cable (UK) for powering 2.2kVA UPS Mains Cable (European) for powering 2.2kVA UPS	SV537016 SV537039 SV537042
PowerChute software for UnixWare 7	SV537043

Processor upgrades	What to order
team*server L800*i 500MHz/512KB Pentium III Xeon	SV656069
team*server L800*i 500MHz/1MB Pentium III Xeon	SV656070
team*server L800*i 550MHz/512KB Pentium III Xeon	SV656089
team*server L800*i 550MHz/1MB Pentium III Xeon	SV656090
team*server L800*i 550MHz/2MB Pentium III Xeon	SV656093



*team*server L800*i* Options	What to order
Additional PSU for **L800*i***	SV578111
Hot-Swap Replacement Fan	SV578113
Server Manager Assist for **L800*i***	SV000143
External SCSI connection for ext. tape	SV521037

Server is supplied with 2 PSUs.
For hot-swap redundancy, an additional PSU is required.
Each PSU requires a separately orderable mains cable.
Hot-swap fans located in 3 places in system cabinet.

Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive	SV546006
35-70GB DLT7000 tape drive*	SV546037
60-120GB DDS-3 4mm DAT Stacker	SV546038
280-560GB DLT7000 Autoloader# (NT only)	SV546045

* Includes SCSI cable for connection to Adaptec 2940UW
# Includes SCSI cable for connection to Adaptec 2944UW

ECC EDO Memory	What to order
128MB RAM (4 * 32MB registered DIMM)	SV656007
256MB RAM (4 * 64MB registered DIMM)	SV656008
512MB RAM (4 * 128MB registered DIMM)	SV656009
1024MB RAM (4 * 256MB registered DIMM)	SV656010

Four way interleaved memory requires memory to be installed in banks of 4 DIMMs, pair on left & pair on right of memory daughter board.
i.e. Those servers supplied with 128MB or 256MB RAM, are comprised of 4 * 32MB or 4 * 64MB DIMMs respectively.

Disk Capacity Required	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10,000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10,000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10,000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum of 252GB disk in system cabinet from 6 x 36GB 1.6" disks and 2 x 18GB 1" disks (10k rpm).
For RAID systems, order PCI RAID Card SV521032 or SV521036. Do not mix 10,000 and 7200 rpm disks on the same RAID controller.
NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity
e.g. All 4GB, 9GB, 18GB or 36GB disks.

Mains Lead Sets	What to order
European	57495001
UK, Asia	57495002
United States	57495004
Australia, Fiji, New Zealand	order locally

*team*server T800*i*

team*server T800*i is a datacentre server utilising the latest Pentium® III Xeon™ processor technology from Intel. Targeted at the high-end server market for large-scale datacentre applications, **T800*i*** offers vast headroom for expansion with exceptional levels of resilience.

- **High-performance Pentium III Xeon 550MHz processors with 1MB or 2MB L2 cache all at full core speed**
- **Upgradeable to 8-way**
- **72GB internal disk, up to 5.2TB external disk**
- **10 dedicated 64-bit hot-swap PCI slots**
- **ECC SDRAM, up to 32GB support**

■ **Processor**	• ***team*server T880*ie:*** Single Pentium III Xeon 550MHz with 1MB integral L2 cache • ***team*server T890*ie:*** Single Pentium III Xeon 550MHz with 2MB integral L2 cache Upgradeable from single to 8-way processing. Intel Profusion Chipset. The profusion carrier provides connectors for two processor mezzanine boards. Each mezzanine board provides four Slot 2 connectors. One processor mezzanine board supplied as standard.
■ **Memory**	32GB 100MHz ECC SDRAM maximum (when two memory carrier boards fitted). Interleaved mode supported when two memory carriers installed. The memory carriers interface to the profusion carrier through the midplane. One memory carrier supplied as standard.
■ **Disks (internal max)**	• 2 x SCA Ultra2/LVD SCSI hot-swap disks in CPU node Maximum internal storage is 72GB from 2 x 36GB 1.6" disks With optional Ultra2/LVD Disk Nodes the maximum storage rises to 5.2TB
■ **I/O buses**	• 4 x dedicated 66MHz 64-bit hot-swap PCI slots • 6 x dedicated 33MHz 64-bit hot-swap PCI slots (1 slot occupied with Intel PRO/100+ Server Adapter)
■ **On-board I/O subsystems**	• Dual channel PCI Ultra2/LVD Symbios SYM53C896 SCSI controller integrated on to the motherboard. One channel is used internally to provide support for the internal SCSI drives (connected to the LVDS hot-swap disk backplane) and CD-ROM or tape drive. The second LVDS channel is routed to the rear of the chassis to support external devices. • I_2O-ready architecture
■ **Storage bays**	• 1 x 5.25 inch format occupied with a CD-ROM drive • 1 x 3.5 inch format occupied with a 3.5 inch diskette drive
■ **Storage in standard configuration**	• 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
■ **Server Management**	Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems.
■ **Graphics as standard**	Integrated SVGA Cirrus Logic CL-GD5446 PCI graphics controller with 2MB Video RAM
■ **Operating system software**	• Windows NT Server 4.0 Enterprise Edition • SCO UnixWare 7.1 * * Additional SMP licences may be needed for multi-processor systems.
■ **Memory Upgrades**	Two dual plug-in carriers containing interleaved pathway to main memory supporting PC100 registered SDRAM. Each memory carrier supports from 128 MB to 16 GB of error correction code (ECC) memory using sixteen 72-bit dual inline memory modules (DIMMs). • 128, 256, 512 and 1024MB ECC SDRAM upgrades
■ **Storage Devices**	• 9GB 1", 18GB 1" and 36GB 1.6" SCA 10,000rpm Ultra2/LVD SCSI hot-swap disk drives • 60-120GB DDS-3 4mm external DAT Stacker • 35-70GB DLT7000 external tape drive • 280-560GB DLT7000 Autoloader external tape drive
■ **Network Controllers**	• Intel PRO/100+ Server Adapter as standard • Intel PRO/1000 Gigabit Server Adapter • Olicom Token-Ring PCI 16/4 Adapter (OC-3140) • SXPCI Asynchronous Host Adapter • Specialix High Connectivity RIO RS-232 Asynchronous Adapter
■ **Disk Controllers**	• Adaptec AHA2940U2W Single-Channel Single-Ended PCI SCSI Adapter • Adaptec AHA2944UW Single-Channel Differential PCI SCSI Adapter • Mylex eXtremeRAID 1100 Ultra2 SCSI PCI RAID Adapter
■ **UPS**	• 3kVA UPS from APC (American Power Conversion)
■ **PSU**	• Ability to upgrade configuration with additional PSU to support redundancy.
■ **Dimensions & Weight**	Height, Width (exc. Feet), Depth (311 x 445 x 711mm), Weight: 51.4kg minimum, 60kg maximum load
■ **Standard warranty**	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

*team*server T880*ie* and T890*ie*

*team*server T800*i* base configurations	What to order
team*server T880*ie, 550MHz/1MB Pentium III Xeon CPU, no HDD, no disk, no RAM	SV663001
team*server T890*ie, 550MHz/2MB Pentium III Xeon CPU, no HDD, no disk, no RAM	SV663003

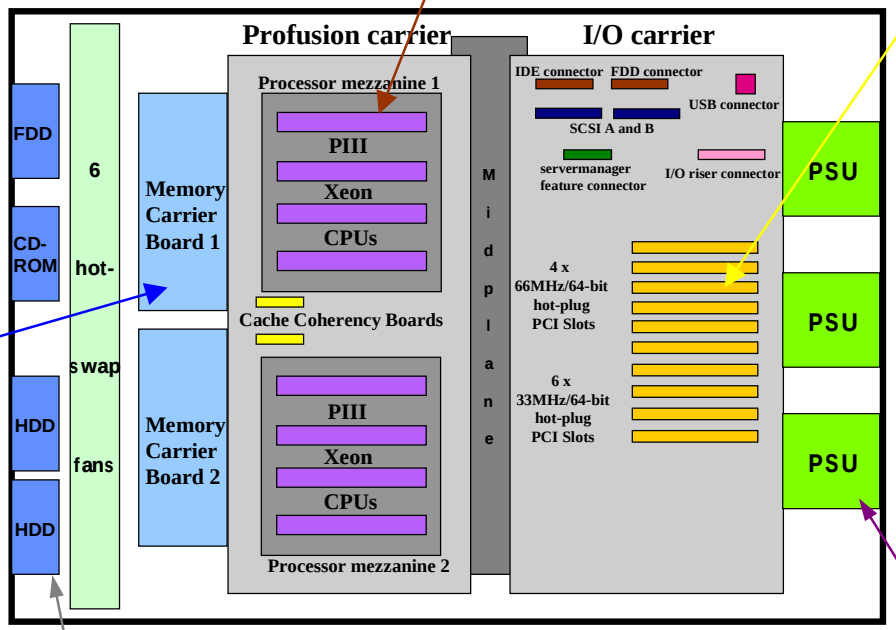
Disk Node for expansion is orderable separately.
System pre-installed with Intel PRO/100+ Server Adapter.
There are no UK versions of the **T8x0*ie*** models because these "zero config" servers are intended to be minimal configurations.

Cirrus Logic CL-GD5446 with 2MB VRAM, is not upgradeable.
Two Server Adapters required to support redundant NIC.
When the server is configured with three power supplies (2 + 1), the third provides redundancy. The supplies can be replaced, hot-swapped, without turning off server power.
The server requires a minimum of two power supplies.
Six fans (5 + 1) cool and circulate air through the server.
The sixth fan is redundant. The fans can be replaced, hot-swapped, without turning off server power. Recommended that failed fan be replaced as soon as possible.

Processor upgrades	What to order
team*server T800*i 550MHz/1MB Pentium III Xeon	SV663005
team*server T800*i 550MHz/2MB Pentium III Xeon	SV663006
Processor board upgrade kit: one processor mezzanine board, two cache coherency boards and four processor termination assemblies	SV663007

External Backup Devices	What to order
35-70GB DLT7000 tape drive # *	SV546037
60-120GB DDS-3 4mm DAT Stacker *	SV546038
280-560GB DLT7000 Autoloader ~ (NT only) requires DLT7000 Autoloader rack mounting kit Optional 6-tape magazine	SV546045 SV546046 SV546047

Includes SCSI cable for connection to Adaptec 2940U2W or to connector on rear panel of CPU node
~ Includes SCSI cable for connection to Adaptec 2944UW
* Up to 2 backup devices can be mounted on a General Purpose Shelf within the rack.



ECC SDRAM Memory	What to order
128MB	SV663014
256MB	SV663015
512MB	SV663016
1024MB (not 1st release)	SV663017
Memory Carrier Upgrade Kit	SV663008

When only a single memory carrier board is installed, DIMM sizes on that carrier may vary, but when both memory carrier boards are installed, the DIMM configuration on the two carriers must be identical to support memory interleaving for performance gains. i.e. To operate in interleaved mode, the DIMMs **must** be installer in pairs (one on each memory carrier) and in the same locations on each carrier.

T800*i* Mains Lead Sets	What to order
European	SV537042
UK	SV537039
Denmark	TBA

The mains cable for the CPU Node PSUs is different to the mains cable required for the Disk Node PSUs.

Disk Capacity Required	What to order
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 1000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10,000rpm SCA Ultra2/LVD SCSI	SV565065
LVD Disk Node	SV657042

Maximum of 72GB hot-swap disk in CPU node from 2 x 36GB 1.6" disks. **For RAID systems, order PCI RAID Card SV521036. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.**

PCI I/O Adapters (Intel PRO/100+ Server Adapter as standard)	What to order
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Intel PRO/1000 Gigabit Server Adapter (Ethernet)	SV520059
Adaptec AHA2940U2W LVD SCSI Adapter Ext. 3m SCSI cable: 2940U2W to Disk Node Ext. 2m SCSI cable for connection from 2940U2W or connector on CPU node to ext. tape device	SV521029 SV642113 SV561009
Adaptec AHA2944UW Differential SCSI Adapter	SV521016
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery) Ext. 3m SCSI cable: Mylex to Disk Node	SV521036 SV642114
SXPCI 32-port Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Olicom Token-Ring 16/4 Adapter (OC3140)	SV520058
P92 dual-port WAN Adapter* # V.24 cable for P92 WAN Adapter V.24 cable for P92 WAN Adapter	SV630002 SV630003 SV630004
FDDI dual port 64-bit 66MHz PCI Adapter #	TBA

* Refer to PD for operating system restrictions
# Not available at first release

*team*server T800*i* Options	What to order
Redundant PSU for CPU node	SV663009
Redundant PSU for Disk node	SV657013
Hot-Swap Replacement Fan for Disk Node	SV578136
Server Manager Assist Pro V2.1 (not 1st rel)	SV000151

CPU node is supplied with 2 PSUs and 6 Fans (5+1).
For hot-swap redundancy, an additional PSU is required.
Each PSU in the Disk Node requires a separately orderable mains cable. The CPU node requires only one mains cable. CPU and Disk Node mains cables differ.

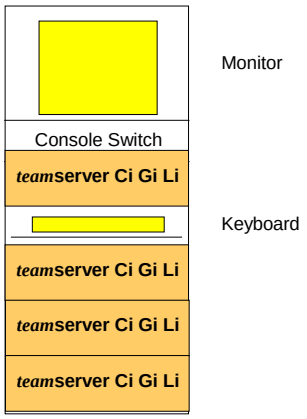
Rack-mounted *team*server 800 series systems

Rack-mounted servers from Fujitsu are the way to save space, reduce the cost of ownership, centralise the administration and achieve a secure installation.

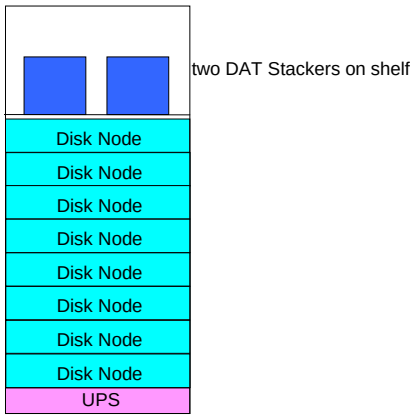
The internal width of the rack enclosure is 19", the standard for rack-mounted equipment, and the internal height is 42U (1U = 1¾" = 44.5mm). The external rack dimensions are 2155mm high, 600mm wide and 900mm deep.

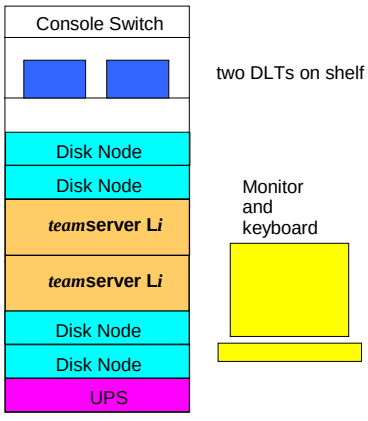
Fujitsu offers a complete range of rack-mount options to suit all customer needs. This includes:

- Rack-mounting kit for fitting **C800*i*** tower servers into a rack.
- Rack-mount **G800*i*** systems.
- Rack-mount **L800*i*** systems.
- Rack-mount **T800*i*** systems.
- Monitor, keyboard and mouse options for the above.
- Disk Node which can house up to eight hard disk drives and can be configured for all rack-mounted **800** series systems.
- Console switches which allow a monitor, keyboard and mouse to be switched between up to 4 servers. Two switches can be cascaded to allow the console to be switched between up to 7 servers.
- A full range of back-up devices, suitable for the large systems which can be assembled and managed using Fujitsu's rack.
- Rack-mounted UPS. If a UPS is installed, it may be shared between all systems in the rack.
- Industry-standard operating systems: Microsoft Windows NT® Server 4.0, SCO UnixWare 7, Novell IntranetWare 4.11 (IntranetWare is not supported on **T800*i***)
- Space-saving storage for a number of servers
- Fully SNMP-compliant server-management solution for centralised systems administration



maximum of **four C*i***, **G*i***, **L*i*** or **T*i*** servers per rack with a console





Note: these diagrams are not to scale.

PRODUCT REFERENCE	DESCRIPTION	HEIGHT
■ **SV642115**	**Rack for M700*i*, C800*i*, G800*i*, L800*i* and T800*i*** – Includes front glazed door, rear door, side panels, castors and rack User Guide.	**42U**
■ **SV642112**	**Replacement back door for M700*i* rack** – Required if a rack-mounted **M800*i*** server will be accommodated in an existing **M700*i*** rack (SV642033).	**–**
	Mains connection – See "Mains Connection: Without a UPS" or "Mains Connection: With a UPS"	
■ **SV642037**	**General Purpose Shelf** – Used for mounting a 15" or 17" monitor or can accommodate up to 2 external DAT Stackers, 1 external DLT or 2 external DLT tape drives if they are mounted on their side. Heights include the shelf.	**Monitor: 10U** **2 DAT: 4U** **1 DLT: 4U** **2 DLT: 6U**
■ **SV642038**	**Keyboard Shelf** – The keyboard and mouse are supported by this sliding shelf.	**2U**
■ **SV642034**	**1U Rack Blanking Plates (pack of three)** – Blanking plates fill areas of unused equipment space within the rack. They are optional and are not required for thermal management.	**1U/2U/3U**
■ **SV642035**	**4U Rack Blanking Plates (pack of three)** – as above	**4U/8U/12U**
■ **SV642036**	**Rack Coupling Kit** – Used for bolting two adjoining racks together. In this configuration, side panels are removed, allowing cables to be run horizontally between racks.	**–**
■ **SV642049**	**Rack User Guide** – This is supplied with each rack but is available for order separately if required	**–**
■ **PD58M093**	**Ergo Pro e155 SVGA Monitor –** Requires a General Purpose Shelf to mount. See the Rack Hardware section.	**10U**
■ **PD53K0E3**	**Ergo Pro e176 SVGA Monitor –** Requires a General Purpose Shelf to mount. See the Rack Hardware section.	**10U**
■ **PK040852**	**Keyboard** – Requires a Keyboard Shelf	**2U or 3U** [1]
■ **PK080133**	**Mouse** – Requires a Keyboard Shelf	**–**
■ **SV642045**	**Rack console switch** – A console switch can switch a monitor, keyboard and mouse between each of up to 4 servers. By cascading two console switches together, the console may be switched between a total of 7 servers. If two switches are cascaded, a Console Switch Cascade cable (see below) is required. A second switch can be mounted behind the first switch and so does not consume any additional rack height.	**1U**
■ **SV616060**	**Server-to-Switch Cable Set** – One set of these cables is needed for each server which is connected to a Rack console switch	**–**
■ **SV616074**	**Switch-to-Switch Cascade Cable** – Needed if two 4-way console switches are cascaded to allow the console to be switched between up to seven servers.	**–**
■ **SV616053**	**Console Extension Cable kit, 7.5m** – Needed if the monitor, keyboard and mouse will be mounted outside the rack. This includes extension cables for monitor, keyboard and mouse.	**–**
■ **SV616052**	**Long printer cable (5 metres)** – For connection to a printer outside the rack.	**–**

[1] With a conventional keyboard, the shelf occupies 2U. An ergonomic keyboard requires 3U.

Mains Connection: Without a UPS

Order the following:

- One or more mains distribution kits – each has four power outlets and includes a pack of internal mains cables
- An appropriate, country-dependent external mains cable for each Mains Distribution Kit

PRODUCT REFERENCE	DESCRIPTION	HEIGHT
■ **SV642116**	**Mains Distribution Kit** – Up to four internal mains cables may be connected to the distribution block which is powered from the wall socket by an appropriate mains lead 57495/001, 57495/002 or 57495/004. More than one Mains Distribution Kit (each with its own external mains lead) may be used within a rack if more than four pieces of equipment need to be powered. The Mains Distribution Kit includes five internal mains cables: four for connecting to equipment within the rack and one for lengthening the external mains cable if required.	–
■ **57495/001** **57495/002** **57495/004**	**External Mains Cable** – An appropriate external mains cable must be ordered for each mains distribution kit or for each piece of equipment if no mains distribution kit is used.	–

External Mains Cables

The country-specific cable options are as follows:

COUNTRY	PRODUCT ID	COUNTRY	PRODUCT ID
Australia	sourced locally†	Malaysia/Africa	57495/002
Belgium	57495/001	Middle East	57495/002
Caribbean/Asia	57495/002	New Zealand	sourced locally†
Denmark	57495/001	North America	57495/004
Eastern Europe	57495/001	North East Asia	57495/004
Fiji	sourced locally†	Norway	57495/001
Finland	57495/001	Portugal	57495/001
France	57495/001	Portuguese Americas	57495/002
Fujitsu Spain	57495/001	Singapore	57495/002
Germany/Austria	57495/001	South Africa	57495/002
Holland	57495/001	Spain	57495/001
India	57495/002	Spanish Americas	57495/002
International	57495/002	Sweden	57495/001
Italy	57495/001	Switzerland	57495/001
Luxembourg	57495/001	UK	57495/002

† Mains cables for use in Australia, New Zealand and Fiji must be ordered locally in these countries.

Mains Connection: With a UPS

A UPS must be hard-wired into the building's mains supply. Order the following:

- UPS – this has 8 power outlets; includes one UPS-to-server signal cable
- UPS mains distribution kit (unterminated external mains cable, pack of 8 internal mains cables, shutdown module)
- Share UPS module if more than one server is to be connected to the UPS
- Signal cable for each server except the first one (because one cable is included with the UPS)
- If necessary, mains splitter cables so the UPS can power more than 8 pieces of equipment

PRODUCT REFERENCE	DESCRIPTION	HEIGHT
■ **SV537035**	**SU3000RMi 3kVA UPS (220–240V)** – Worldwide except North America and Japan; has 8 mains outlets. Includes a PowerChute Signal Cable	**3U**
■ **SV642063**	**UPS Mains Distribution Kit** – Includes an external mains cable for connecting the supply to the UPS, a kit of 8 internal cables (2 metres) for connecting equipment to the UPS, and a Shutdown Module. [1]	**–**
■ **SV616061**	**Power supply splitter cable, 3-way** – Needed if more than 8 mains devices must be powered from the UPS. One end connects to an output socket on the UPS or to an internal mains cable; the other ends can then power up to three pieces of equipment (from the plug to the furthest socket is 1.5 metres).	**–**
■ **SV537020**	**Share UPS Module** – One Share UPS Module is needed per rack if the UPS will drive more than one server. It allows up to eight servers to be driven from one UPS.	**–**
■ **SV537034**	**PowerChute Signal Cable** – One of these cables is needed for the second server and one for each subsequent server that is connected to the Share UPS Module.	**–**

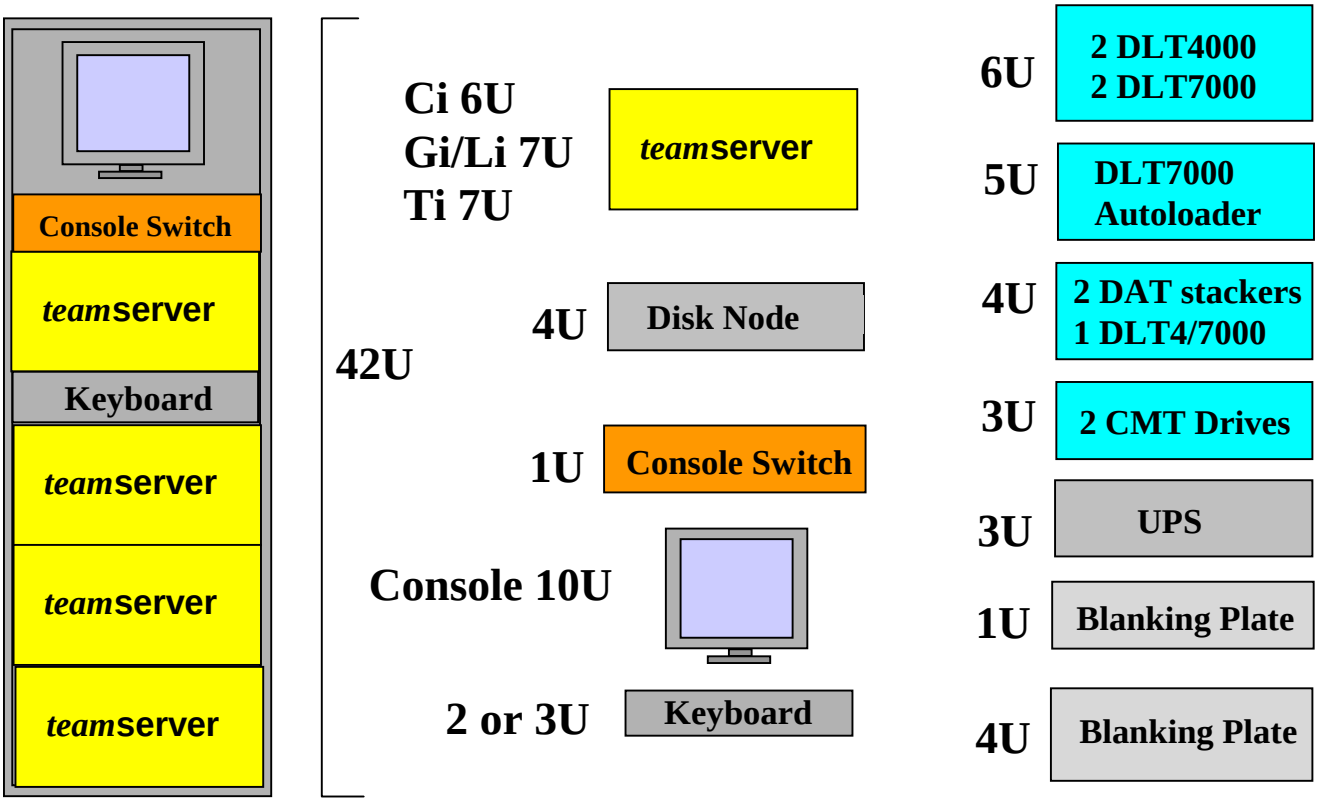
[1] The Shutdown Module is used for shutting off the power output of the UPS in an emergency

Please refer also to **PD-SR-0007** for rack UPS information. At present, full support for a UPS is not available if UnixWare 7 is used.
The 3kVA rack-mount unit (SV537035) powers the equipment in one rack. It must be mounted at the bottom of the rack.
If a UPS is required, the following products must be ordered:

- a UPS which is appropriate for the local mains supply
- an appropriate UPS Mains Distribution Kit
- a Share UPS Module and one or more PowerChute Signal Cables, if the UPS is to power more than one server

The number of Processor and/or Disk Nodes that can be driven by one UPS is influenced by the power consumption of the components which are installed. The hold-up time must be long enough (eg 10 minutes) to permit the system to shut down completely if the mains supply fails for a lengthy period of time.

Rack-mount Module Calculation Sheet



Note: these diagrams are not to scale.

Modules		Height	Quantity	Total
Processor	Ci 6U, Gi/Li/Ti 7U		_____	_____
Disk		4U	_____	_____
Console		10U	_____	_____
Keyboard & Mouse		2U	_____	_____
Ergonomic Keyboard & Mouse		3U	_____	_____
Console Switch		1U	_____	_____
DLT4000 (max 2 per shelf)		4 or 6U	_____	_____
DLT7000 (max 2 per shelf)		4 or 6U	_____	_____
DLT7000 Autoloader		5U	_____	_____
DAT Stacker (max 2 per shelf)		4U	_____	_____
UPS		3U	_____	_____
Blanking Plate		4U	_____	_____
Blanking Plate		1U	_____	_____
			Total (max 42U)	_____

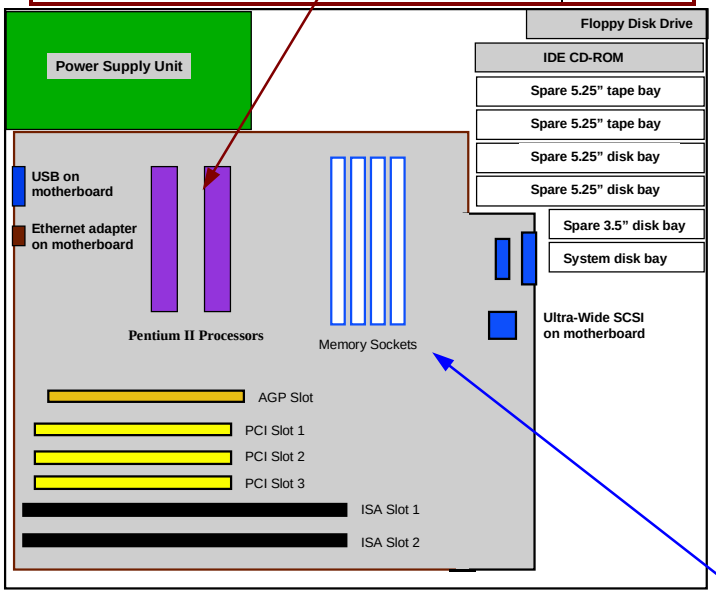
Rack-mount *team*server C820*i*, C840*ie*, C870*i* and C870*ie*

*team*server C800*i* configurations	What to order
***team*server C800*i* rack fitting kit** - Consists of rack-mounting brackets, a shelf & a front bezel	SV578110
Note that a C8x0*i* and a C800*i* rack fitting kit are both required for a rack-mount C8x0*i*	
***team*server C820*i* /Z**, 400MHz/512KB Pentium II CPU, no HDD, no RAM	SV578156
***team*server C820*i* /B**, 400MHz/512KB Pentium II CPU, no HDD, 64MB RAM	SV578084 (SV578090)‡
***team*server C820*i* /E**, 400MHz/512KB Pentium II CPU, 4GB HDD, 64MB RAM	SV578085 (SV578091)‡
***team*server C820*i* /P**, 400MHz/512KB Pentium II CPU, 9GB HDD, 128MB RAM	SV578086 (SV578092)‡
***team*server C840*ie*/Z**, 450MHz/512KB Pentium III CPU, no HDD, no RAM	SV578176
***team*server C840*ie*/E**, 450MHz/512KB Pentium III CPU, 4GB HDD, 64MB RAM	SV578194 (SV578197)‡
***team*server C840*ie* /P**, 450MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578177 (SV578178)‡
***team*server C870*i* /Z**, 500MHz/512KB Pentium III CPU, no HDD, no RAM	SV578164
***team*server C870*i* /E**, 500MHz/512KB Pentium III CPU, 4GB HDD, 128MB RAM	SV578196 (SV578199)‡
***team*server C870*i* /P**, 500MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578165 (SV578166)‡
***team*server C870*ie* /Z**, 550MHz/512KB Pentium III CPU, no HDD, no RAM	SV578186
***team*server C870*ie* /B**, 550MHz/512KB Pentium III CPU, 4GB HDD, 128MB RAM	SV578187 (SV578189)‡
***team*server C870*ie* /E**, 550MHz/512KB Pentium III CPU, 9GB HDD, 128MB RAM	SV578188 (SV578190)‡

‡ UK server which includes UK keyboard, mouse and power cable.
There are no UK versions of the **C8x0*i*/Z** models because these "zero config" servers are intended to be minimal configurations.

A maximum of 7 **C800*i*** servers (without a console) or 4 **C800*i*** servers (with a console) may be fitted in a rack.

Dual Processor Upgrades	What to order
team*server C800*i 400MHz/512KB Pentium II CPU	SV578078
team*server C800*i 450MHz/512KB Pentium III CPU	SV578179
team*server C800*i 500MHz/512KB Pentium III CPU	SV578172
team*server C800*i 550MHz/512KB Pentium III CPU	SV578192



PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Eicon P92 dual-port WAN Adapter (UnixWare only)	SV630002
FDDI PCI Adapter: Dual-Attach Station (DAS SK5544)	SV631002
Olicom 16/4 Token Ring card (OC3140)	SV520058
Adaptec AHA2940UW SE SC SCSI adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
Adaptec AHA2940U2W Ultra2/LVD SC SCSI adapter Ext. 3m SCSI cable: Adaptec 2940U2W to Disk Node	SV521029 SV642113
SXPCI 32-port PCI Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port PCI Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Mylex AcceleRAID 250 Ultra2 SCSI RAID adapter (8MB) (Either card to be used with SCA disks and Hot-swap Cage)	SV521033
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery) (To be used with Fujitsu Disk Node) Ext. 3m SCSI cable: Mylex RAID to Disk Node	SV521036 SV642114

* Refer to PD for operating system restrictions

Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive (CMT compatible)	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive *	SV546006
35-70GB DLT7000 tape drive *	SV546037
60-120GB DDS-3 4mm DAT Stacker *	SV546038

* Up to 2 backup devices can be mounted on a General Purpose Shelf within the rack.

Hot-swap Disk Options (Maximum of 3 SCA & one 3.5" disks)	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
Hot-swap Cage – can accommodate up to 3 hot-swap SCA disks (includes 3 disk carriers)	SV578097

Fixed Disk Options (Maximum of 4 Ultra or 5 Ultra2 3.5" disks)	What to order
4 GB 1" 7200rpm 68 pin Ultra-SCSI	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565067
Up to two 3.5" disks can be installed in the 5.25" disk bays if the hot-swap cage is not used. One of the tape bays can also be used for one Ultra2/LVD 68-pin disk.	

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

* Maximum of 1GB requires removal of initial 64MB or 128MB ECC Memory. DIMMs of different sizes may be mixed.

*team*server C800*i* Options	What to order
Server Manager Assist for **C800*i***	SV000142

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RAID note: the SCSI cable provided with the server can be used when configuring the Mylex RAID card for internal disks.
For RAID 5 configurations it is recommended that the disks are all of the same capacity. e.g. All 4GB, 9GB or 18GB disks.

Rack-mount *team*server G820*i*, G840*ie*, G870*i*, G870*ie* and G870*ix*

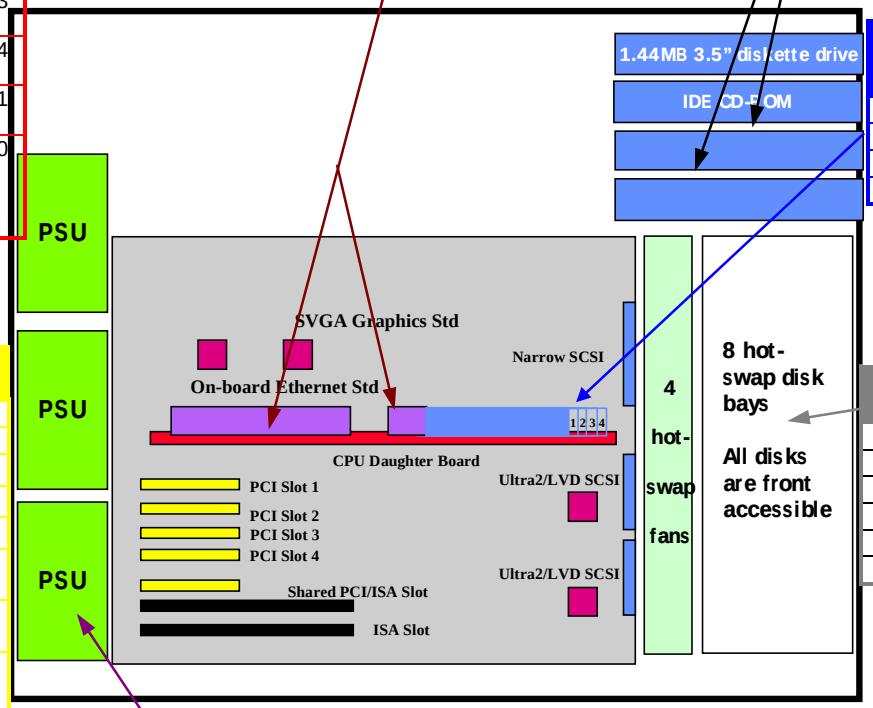
*team*server G800*i* configurations	What to order
Rack-mount *team*server G820*i* 0MB, 400MHz/512KB Pentium II CPU, LVD, no HDD, no RAM	SV661027
Rack-mount *team*server G820*i* 128MB, 400MHz/512KB Pentium II CPU, LVD, no HDD, 128MB RAM	SV661028
Rack-mount *team*server G840*ie* 0MB, 450MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661029
Rack-mount *team*server G840*ie* 128MB, 450MHz/512KB Pentium III CPU, LVD, no HDD, 128MB RAM	SV661030
Rack-mount *team*server G870*i* 0MB, 500MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV578170
Rack-mount *team*server G870*i* 128MB, 500MHz/512KB Pentium III CPU, LVD, no HDD, 128MB RAM	SV578171
Rack-mount *team*server G870*ie* 0MB, 550MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661043
Rack-mount *team*server G870*ie* 128MB, 550MHz/512KB Pentium III CPU, LVD, no HDD, 128MB RAM	SV661044
Rack-mount *team*server G870*ix* 0MB, 600MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661051
team*server G800*i* rack fitting kit –** Consists of rack-mounting brackets, replacement side panels and front bezel. It is only needed if an existing tower **G800*i is to be converted so it can be fitted in a rack.	SV578140

A maximum of 6 **G800*i*** servers (without a console) or 4 **G800*i*** servers (with a console) mau be fitted into a rack.

PCI I/O Adapters (Intel 82558 Ethernet controller on motherboard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Eicon P92 dual-port WAN Adapter (UnixWare only)	SV630002
FDDI PCI Adapter: Dual-Attach Station (DAS SK5544)	SV631002
Olicom 16/4 Token Ring card (OC3140)	SV520058
Adaptec AHA2940UW SE SC SCSI adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
Adaptec AHA2940U2W Ultra2/LVD SC SCSI adapter Ext. 3m SCSI cable: Adaptec 2940U2W to Disk Node	SV521029 SV642113
SXPCI 32-port PCI Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port PCI Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery) Ext. 3m SCSI cable: Mylex RAID to Disk Node	SV521036 SV642114

* Refer to PD for operating system restrictions

Processor upgrades	What to order
team*server G800*i 400MHz Pentium II Upgrade	SV578078
team*server G800*i 450MHz Pentium III Upgrade	SV578179
team*server G800*i 500MHz Pentium III Upgrade	SV578172
team*server G800*i 550MHz Pentium III Upgrade	SV578192
team*server G800*i 600MHz Pentium III Upgrade	SV578215



*team*server G800*i* Options	What to order
Additional PSU for **G800*i***	SV578111
Hot-Swap Replacement Fan	SV578113
Server Manager Assist for **G800*I***	SV000147
External SCSI connection for ext. tape	SV521037

Server is supplied with 1 PSU.
For hot-swap redundancy, an additional PSU is required.
Each PSU requires a separately orderable mains cable.

Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive *	SV546006
35-70GB DLT7000 tape drive *	SV546037
60-120GB DDS-3 4mm DAT Stacker *	SV546038

* Up to 2 backup devices can be mounted on a General Purpose Shelf within the rack.

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095
512MB	SV578180

* Maximum of 1GB requires removal of initial 64MB or 128MB ECC Memory.
DIMMs of different sizes may be mixed.
Note: 512MB upgrade not available on non-Ultra2/LVD models (SV578098 – SV578154)

Disk Capacity Required	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum of 252GB disk in system cabinet from 6 x 36GB and 2 x 18GB disks.
For RAID systems, order PCI RAID Card SV521032 or SV521036.
NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 4GB, 9GB, 18GB or 36GB disks.

Rack-mount *team*server L870*i*, L880*i*, L870*ie*, L880*ie*, L890*ie*

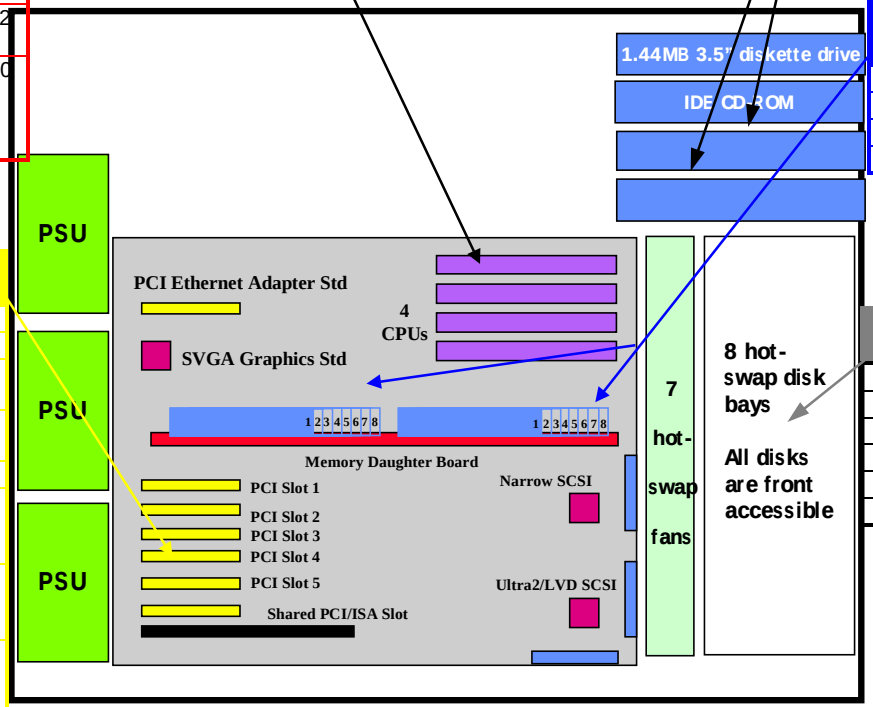
*team*server L800*i* base configurations	What to order
Rack-mount *team*server L870*i* 0MB, 500MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656071
Rack-mount *team*server L870*i* 128MB, 500MHz/512KB Pentium III Xeon CPU, no HDD, 128MB RAM	SV656073
Rack-mount *team*server L880*i* 0MB, 500MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656072
Rack-mount *team*server L880*i* 128MB, 500MHz/1MB Pentium III Xeon CPU, no HDD, 128MB RAM	SV656074
Rack-mount *team*server L870*ie* 0MB, 550MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656087
Rack-mount *team*server L880*ie* 0MB, 550MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656088
Rack-mount *team*server L890*ie* 0MB, 550MHz/2MB Pentium III Xeon CPU, no HDD, no RAM	SV656092
team*server L800*i* rack fitting kit –** Consists of rack-mounting sliders, shelves and front bezel. It is only needed if an existing tower **L800*i is to be converted so that it can be fitted in a rack.	SV578140

System pre-installed with Intel PRO/100+ Management Adapter
A maximum of 6 **L800*i*** servers (without a console) or 4 **L800*i*** servers (with a console) may be fitted into a rack.

PCI I/O Adapters (Intel PRO/100+ Management Adapter as standard)	What to order
Intel EtherExpress PRO/10+ PCI adapter (Ethernet)*	SV520048
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Adaptec AHA2940UW SE SC SCSI Adapter External SCSI cable 2m (Adaptec to ext tape dev)	SV521002 SV561009
Adaptec AHA2940U2W Ultra2/LVD SC SCSI adapter Ext. 3m SCSI cable: Adaptec 2940U2W to Disk Node	SV521029 SV642113
Adaptec AHA2944UW Differential SCSI Adapter	SV521016
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery) Ext. 3m SCSI cable: Mylex RAID to Disk Node	SV521036 SV642114
SXPCI 32-bit Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-bit Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Olicom 16/4 Token Ring card (OC3140)	SV520058
P92 dual-port WAN Adapter* V.24 cable for P92 WAN Adapter X.21 cable for P92 WAN Adapter	SV630002 SV630003 SV630004
FDDI Adapter: Dual Attach Station (DAS) (SK5544)*	SV631002

* Refer to PD for operating system restrictions

Processor upgrades	What to order
team*server L800*i 500MHz/512KB Pentium III Xeon	SV656069
team*server L800*i 500MHz/1MB Pentium III Xeon	SV656070
team*server L800*i 550MHz/512KB Pentium III Xeon	SV656089
team*server L800*i 550MHz/1MB Pentium III Xeon	SV656090
team*server L800*i 550MHz/2MB Pentium III Xeon	SV656093



CPU note: 1½ voltage regulators required per processor, 6 voltage regulators are available.
SVGA note: Cirrus Logic CL-GD5480 with 2MB VRAM, is not upgradeable.

Internal Backup Devices (Maximum of 2 devices)	What to order
4-8GB SLR5 QIC tape drive	SV546035
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
OR one from	
20-40GB DLT4000 tape drive	SV546034
External Backup Devices	
20-40GB DLT4000 tape drive *	SV546006
35-70GB DLT7000 tape drive # *	SV546037
60-120GB DDS-3 4mm DAT Stacker *	SV546038
280-560GB DLT7000 Autoloader ~ (NT only) requires DLT7000 Autoloader rack mounting kit	SV546045 SV546046

\# Includes SCSI cable for connection to Adaptec 2940UW
~ Includes SCSI cable for connection to Adaptec 2944UW
* Up to 2 backup devices can be mounted on a General Purpose Shelf within the rack.

ECC EDO Memory	What to order
128MB RAM (4 * 32MB registered DIMM)	SV656007
256MB RAM (4 * 64MB registered DIMM)	SV656008
512MB RAM (4 * 128MB registered DIMM)	SV656009
1024MB RAM (4 * 256MB registered DIMM)	SV656010

Four way interleaved memory requires memory to be installed in banks of 4 DIMMs, pair on left & pair on right of memory daughter board.
i.e. Those servers supplied with 128MB or 256MB RAM, are comprised of 4 * 32MB or 4 * 64MB DIMMs respectively.

Disk Capacity Required	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10,000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10,000rpm SCA Ultra2/LVDSCSI	SV565064
36 GB 1.6" 10,000rpm SCA Ultra2/LVDSCSI	SV565065

Maximum of 252GB disk in system cabinet from 6 x 36GB 1.6" disks and 2 x 18GB 1" disks (10k rpm).
For RAID systems, order PCI RAID Card SV521032 or SV521036. Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity
e.g. All 4GB, 9GB, 18GB or 36GB disks.

*team*server L800*i* Options	What to order
Additional PSU for **L800*i***	SV578111
Hot-Swap Replacement Fan	SV578113
Server Manager Assist Pro for **L800*i***	SV000143
External SCSI connection for ext. tape	SV521037

Server is supplied with 2 PSUs.
For hot-swap redundancy, an additional PSU is required.
Each PSU requires a separately orderable mains cable.
Hot-swap fans located in 3 places in system cabinet.

Rack-mount *team*server T880*ie* and T890*ie*

*team*server T800*i* base configurations	What to order
team*server T880*ie, 550MHz/1MB Pentium III Xeon CPU, no HDD, no disk, no RAM	SV663001
team*server T890*ie, 550MHz/2MB Pentium III Xeon CPU, no HDD, no disk, no RAM	SV663003

Disk Node for expansion is orderable separately.
System pre-installed with Intel PRO/100+ Server Adapter.
There are no UK versions of the **T8x0*ie*** models because these "zero config" servers are intended to be minimal configurations.

Cirrus Logic CL-GD5446 with 2MB VRAM, is not upgradeable.
Two Server Adapters required to support redundant NIC.
When the server is configured with three power supplies (2 + 1), the third provides redundancy. The supplies can be replaced, hot-swapped, without turning off server power.
The server requires a minimum of two power supplies.
Six fans (5 + 1) cool and circulate air through the server.
The sixth fan is redundant. The fans can be replaced, hot-swapped, without turning off server power. Recommended that failed fan be replaced as soon as possible.

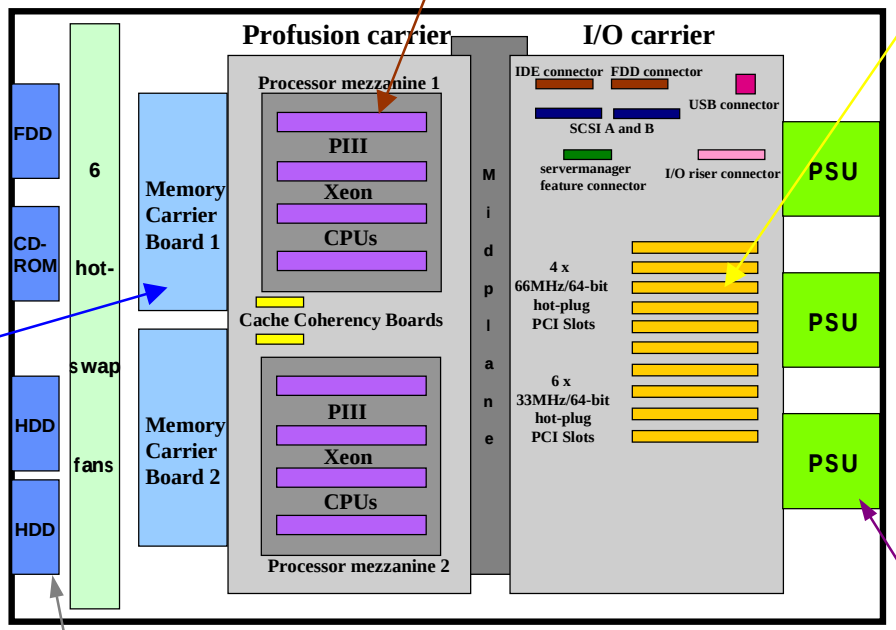
ECC SDRAM Memory	What to order
128MB	SV663014
256MB	SV663015
512MB	SV663016
1024MB (not 1st release)	SV663017
Memory Carrier Upgrade Kit	SV663008

When only a single memory carrier board is installed, DIMM sizes on that carrier may vary, but when both memory carrier boards are installed, the DIMM configuration on the two carriers must be identical to support memory interleaving for performance gains. i.e. To operate in interleaved mode, the DIMMs **must** be installer in pairs (one on each memory carrier) and in the same locations on each carrier.

T800*i* Mains Lead Sets	What to order
European	SV537042
UK	SV537039
Denmark	TBA

The mains cable for the CPU Node PSUs is different to the mains cable required for the Disk Node PSUs.

Processor upgrades	What to order
team*server T800*i 550MHz/1MB Pentium III Xeon	SV663005
team*server T800*i 550MHz/2MB Pentium III Xeon	SV663006
Processor board upgrade kit: one processor mezzanine board, two cache coherency boards and four processor termination assemblies	SV663007



Disk Capacity Required	What to order
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 1000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10,000rpm SCA Ultra2/LVD SCSI	SV565065
LVD Disk Node	SV657042

Maximum of 72GB hot-swap disk in CPU node from 2 x 36GB 1.6" disks. **For RAID systems, order PCI RAID Card SV521036. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.**

External Backup Devices	What to order
35-70GB DLT7000 tape drive # *	SV546037
60-120GB DDS-3 4mm DAT Stacker *	SV546038
280-560GB DLT7000 Autoloader ~ (NT only) requires DLT7000 Autoloader rack mounting kit	SV546045 SV546046

Includes SCSI cable for connection to Adaptec 2940U2W or to connector on rear panel of CPU node
~ Includes SCSI cable for connection to Adaptec 2944UW
* Up to 2 backup devices can be mounted on a General Purpose Shelf within the rack.

PCI I/O Adapters (Intel PRO/100+ Server Adapter as standard)	What to order
Intel PRO/100+ Server Adapter (Ethernet)*	SV520056
Intel PRO/1000 Gigabit Server Adapter (Ethernet)	SV520059
Adaptec AHA2940U2W LVD SCSI Adapter Ext. 3m SCSI cable: 2940U2W to Disk Node Ext. 2m SCSI cable for connection from 2940U2W or connector on CPU node to ext. tape device	SV521029 SV642113 SV561009
Adaptec AHA2944UW Differential SCSI Adapter	SV521016
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery) Ext. 3m SCSI cable: Mylex to Disk Node	SV521036 SV642114
SXPCI 32-port Async Adapter 4-port Terminal Adapter for SXPCI Async Adapter 8-port Terminal Adapter for SXPCI Async Adapter	SV521027 SV520015 SV520016
RIO 128-port Async Adapter 16-port RTA with DB25 connector 16-port RTA with RJ45 connector	SV521028 SV521030 SV521031
Olicom Token-Ring 16/4 Adapter (OC3140)	SV520058
P92 dual-port WAN Adapter* # V.24 cable for P92 WAN Adapter V.24 cable for P92 WAN Adapter	SV630002 SV630003 SV630004
FDDI dual port 64-bit 66MHz PCI Adapter #	TBA

* Refer to PD for operating system restrictions
# Not available at first release

*team*server T800*i* Options	What to order
Redundant PSU for CPU node	SV663009
Redundant PSU for Disk node	SV657013
Hot-Swap Replacement Fan for Disk Node	SV578136
Server Manager Assist Pro V2.1 (not 1st rel)	SV000151

CPU node is supplied with 2 PSUs and 6 Fans (5+1).
For hot-swap redundancy, an additional PSU is required.
Each PSU in the Disk Node requires a separately orderable mains cable. The CPU node requires only one mains cable. CPU and Disk Node mains cables differ.

Fujitsu Disk Node Ultra-Wide Single Ended

Connectivity is determined by the number of free PCI slots in the System Node.

- Using single-channel Adaptec 2940UW SCSI cards, 1 Disk Node may be connected to each card.
- Using dual-channel Mylex eXtremeRAID cards, up to 2 Disk Nodes may be connected to each card.

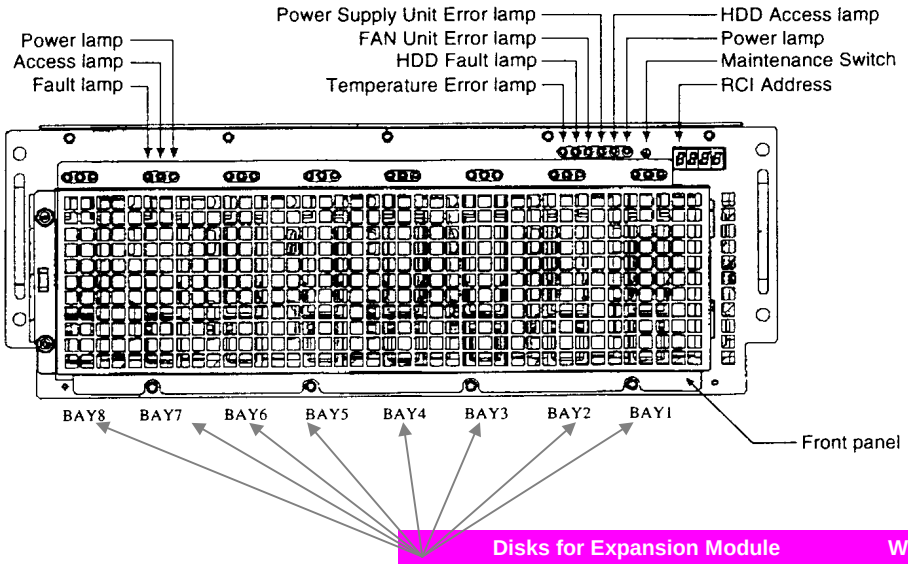
SCSI/RAID adapters and cables	What to order
Adaptec AHA2940UW SCSI card	**SV521002**
External SCSI Cable 3m for Adaptec AHA2940UW	**SV642113**
Mylex eXtremeRAID 1100 Ultra2 SCSI RAID adapter (32MB, with battery)	**SV521036**
External SCSI Cable 3m for Mylex DAC960PG or eXtremeRAID †	**SV642114**
† Two cables are needed if both SCSI channels on the card are used.	

Note: cables are not provided with the disk node.

The Fujitsu Disk Node can contain up to eight disks. Note that SCA disks which are suitable for a System Node can be used in a Disk Node and vice-versa: see the tables below. A maximum of ten Disk Nodes can be fitted into a rack.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
Ultra-Wide Single Ended Disk Node	SV657030
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136



Disks for Expansion Module	What to order
4 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
18GB 1.6” 7200rpm SCA Ultra2/LVD SCSI	SV565056
9GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565064

Maximum 8 x 18GB disks in disk node.

For RAID systems, order PCI RAID Card SV521036.
Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 4GB, 9GB or 18GB disks.

Fujitsu Disk Node Ultra2/LVD

Connectivity is determined by the number of free PCI slots in the System Node.

- Using single-channel Adaptec 2940U2W SCSI cards, 1 Disk Node may be connected to each card.
- Using dual-channel Mylex eXtremeRAID cards, up to 2 Disk Nodes may be connected to each card.

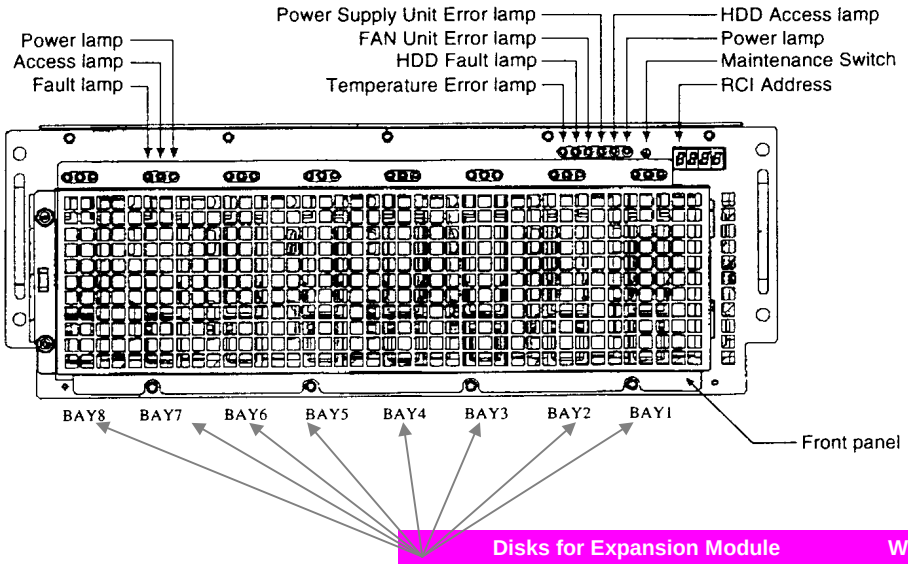
SCSI/RAID adapters and cables	What to order
Adaptec AHA2940U2W single channel SCSI card	**SV521029**
External SCSI Cable 3m for Adaptec AHA2940U2W to Disk Node	**SV642113**
Mylex eXtremeRAID 1100 (DAC1164) dual channel RAID card (32MB, with battery backup)	**SV521036**
External SCSI Cable 3m for Mylex eXtremeRAID to Disk Node †	**SV642114**
† Two cables are needed if both SCSI channels on the card are used.	

Note: cables are not provided with the disk node.

The Fujitsu Disk Node can contain up to eight disks. Note that this Disk Node can drive disks in LVD mode. A maximum of ten Disk Nodes can be fitted into a rack.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
Ultra2/LVD Disk Node (4U height)	SV657042
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136



Disks for Expansion Module	What to order
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1.6” 7200rpm SCA Ultra2/LVD SCSI	SV565056
18GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
9GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565064
36GB 1.6” 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum of 288GB from 8 x 36GB 1.6” disks in Disk Node.
For RAID systems, order PCI RAID Card SV521036.
Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.

Microsoft Cluster Server on C800*i*, G800*i* and L800*i* (Single Ended Disk Node)

Microsoft Cluster Server (MSCS) is a built-in feature of Windows NT Server, Enterprise Edition. It is a Microsoft software product that supports the connection of two servers into a 'cluster' for higher availability and easier manageability of data and applications. MSCS can automatically detect and recover from server or application failures. It can be used to move server workload to balance utilisation and to provide for planned maintenance without downtime.

Fujitsu C800*i*/G800*i*/L800*i* MSCS Configuration

Fujitsu is offering a cost effective rack-mounted MSCS configuration based on two 800 series servers and shared disk storage that is controlled via RAID Host Bus Adapters (HBAs). Each server has a Mylex eXtremeRAID 1100 (DAC1164P) controller (with 'cluster aware' firmware) connected to two standard 800 series single ended Disk Nodes giving a maximum of 16 disks (8 per disk node). An upgrade is available that allows the addition of an extra eXtremeRAID controller in each server to which one or two additional Disk Nodes may be attached, giving a maximum of 32 disks (8 per Disk Node). These configurations provide extra resilience by using separately powered Disk Nodes that can be mirrored, with the option of redundant power supply modules as well.

PRODUCT SPECIFICATION

The products specified, ***team*server C800*i* cluster, *team*server G800*i* cluster** and ***team*server L800*i* cluster**, are configurations based on MSCS. No changes or additions have been made to MSCS - this is a Microsoft product and comes as part of Windows NT Server, Enterprise Edition 4.0.

MSCS supports fail-over on a 2-node configuration enabling recovery from common server and application failures. Clusters can be managed via an MSCS graphical administration tool. In addition, MSCS APIs are available from Microsoft to enable scaleable, cluster-aware applications to be created.

The Mylex eXtremeRAID 1100 (DAC1164P) controller has the following features:

- Ultra2/LVD speed - 2 Channels
- Up to 64MB Cache (32MB standard)
- RAID levels JBOD, 0, 1, 3, 5, 0+1, 10, 30 and 50
- Global Array Manager

RAID Levels

As stated above, RAID levels JBOD, 0, 1, 3, 5, 0+1, 10, 30 and 50 are supported. This gives flexibility in that users are not restricted to RAID 1 mirroring but can have a mixture of RAID types. However, users should be aware that (say) loss of a disk node in a non-mirrored RAID configuration could result in significant down-time while the repair takes place.

- The RAID controller groups disk drives in 'drive packs' up to a maximum of eight disks per pack.
- Each RAID array is built using a 'drive pack' and thus the maximum number of disks in an individual RAID array is 8, the minimum for each pack depends upon the RAID level – see above.
- The resulting RAID array is called a 'logical drive' and appears to Windows NT as a single disk drive that can be assigned a drive letter. The maximum number of logical drives per 2-channel eXtremeRAID controller is 32.
- To overcome the eight disk limit per disk array the RAID controller supports 'spanning'. If two disk packs of 8 x 18GB drives are defined, without spanning, the controller would present this as two separate logical drives. With spanning, although two RAIDs have been defined, they are spanned together to create a single logical drive of twice the size. Spanning also makes more efficient use of different disk capacities. If three disks of 9GB and three disks of 18GB are installed, using spanning, a single logical drive using the full capacity of all drives (81GB) can be achieved. Note the figures above do not include the overhead for redundant information. Spanning requires consecutive drive packs with the same number of disk drives and the maximum number of drive packs which can be spanned is four.
- The RAID controller supports global hot spare. Any device, which is not included in a drive pack is automatically regarded by the controller to be a global hot spare. Hot spare drive(s) must be no smaller than the largest disk in the array (for example if a two hot spares must be available to two separate RAID 1 arrays, one using 9GB and one using 18GB drives, then the hot spares should both be 18GB)
- The eXtremeRAID Controller is a *hardware* RAID device – users should not attempt to use any NT (software) RAID configurations in conjunction with this.

MSCS on Rack-mount C800*i* with S/E Disk Node

*team*server C800*i* configurations	What to order
***team*server C800*i* rack fitting kit** - Consists of rack-mounting brackets, a shelf & a front bezel	SV578110
Note that a C8x0*i* and a C800*i* rack fitting kit are both required for a rack-mount C8x0*i*	
***team*server C820*i* /Z**, 400MHz/512KB Pentium II CPU, no HDD, no RAM	SV578156
***team*server C840*iel*Z**, 450MHz/512KB Pentium III CPU, no HDD, no RAM	SV578176
***team*server C870*i* /Z**, 500MHz/512KB Pentium III CPU, no HDD, no RAM	SV578164

Two ***team*server C800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

1 or 2 CPU(s) require a minimum of 128MB memory.

MSCS Mylex SE Kits	What to order
MSCS Mylex SE Kit for 800i Range Servers*	SV520060
MSCS Mylex SE Upgrade Kit for 800i Range Servers#	SV520061

*If it is required to upgrade an existing rack-mount ***team*server C800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520060 MSCS Mylex SE kit for ***team*server** 800 comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

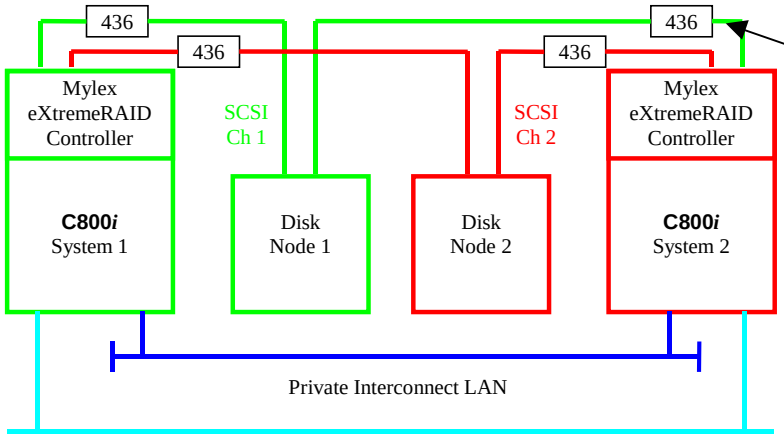
#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.

System Hot-swap Disk Options (Maximum of 3 SCA & one 3.5" disks)	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
Hot-swap Cage – can accommodate up to 3 hot-swap SCA disks (includes 3 disk carriers)	SV578097

System Fixed Disk Options (Maximum of 4 Ultra or 5 Ultra2 3.5" disks)	What to order
4 GB 1" 7200rpm 68 pin Ultra-SCSI	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565067
Up to two 3.5" disks can be installed in the 5.25" disk bays if the hot-swap cage is not used. One of the tape bays can also be used for one Ultra2/LVD 68-pin disk.	
Note: One system disk required per server. Minimum system disk size > (3 * memory) + 2GB This is for operating system files & page file.	

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server



Cluster Helpers: SCSI bus extenders, also provides termination if server fails. Part of MSCS SCSI kit.

Disks for SE Disk Node	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
18GB 1.6" 7200rpm SCA Ultra2/LVD SCSI	SV565056
9GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064

Maximum 8 x 18GB 1.6" disks in disk node.
It is recommended that all disks are the same capacity.

The Fujitsu Disk Node can contain up to eight disks. Note that the 10k rpm SCA disks which are suitable for a Disk Node cannot be used in the **C800*i*** system.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
Disk Node	SV657030
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

MSCS on Rack-mount G800*i* with S/E Disk Node

*team*server G800*i* configurations	What to order
Rack-mount *team*server G820*i* 0MB, 400MHz/512KB Pentium II CPU, LVD, no HDD, no RAM	SV661027
Rack-mount *team*server G840*ie* 0MB, 450MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661027
Rack-mount *team*server G870*i* 0MB, 500MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV578170
team*server G800*i* rack fitting kit –** Consists of rack-mounting brackets, replacement side panels and front bezel. It is only needed if an existing tower **G800*i is to be converted so it can be fitted in a rack.	SV578140

Two ***team*server G800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

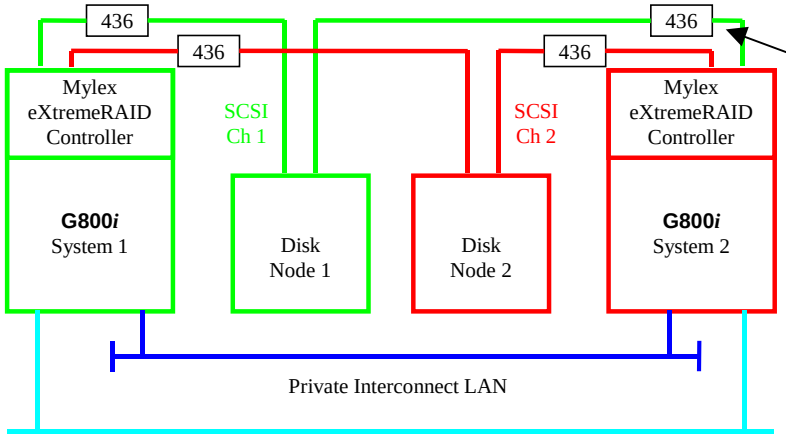
1 or 2 CPU(s) require a minimum of 128MB memory.

MSCS Mylex SE Kits	What to order
MSCS Mylex SE Kit for 800i Range Servers*	SV520060
MSCS Mylex SE Upgrade Kit for 800i Range Servers#	SV520061

*If it is required to upgrade an existing rack-mount ***team*server G800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520060 MSCS Mylex SE kit for ***team*server** 800 comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.



Cluster Helpers: SCSI bus extenders, also provides termination if server fails. Part of MSCS SCSI kit.

System Disk Options	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV642054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

One system disk required per server.
Minimum system disk size > (3 * memory) + 2GB
This is for operating system files & page file.

Disks for SE Disk Node	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
18GB 1.6" 7200rpm SCA Ultra2/LVD SCSI	SV565056
9GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064

Maximum 8 x 18GB 1.6" disks in disk node.
It is recommended that all disks are the same capacity.

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server

The Fujitsu Disk Node can contain up to eight disks.

The rack-mount Disk includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
Disk Node	SV657030
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

MSCS on Rack-mount L800*i* with S/E Disk Node

teamserver L800*i* base configurations	What to order
Rack-mount *teamserver* L870*i* 0MB, 500MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656071
Rack-mount *teamserver* L880*i* 0MB, 500MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656072
teamserver* L800*i* rack fitting kit –** Consists of rack-mounting sliders, shelves and front bezel. It is only needed if an existing tower **L800*i is to be converted so that it can be fitted in a rack.	SV578140

Two ***teamserver* L800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC EDO Memory	What to order
128MB RAM (4 * 32MB registered DIMM)	SV656007
256MB RAM (4 * 64MB registered DIMM)	SV656008
512MB RAM (4 * 128MB registered DIMM)	SV656009
1024MB RAM (4 * 256MB registered DIMM)	SV656010

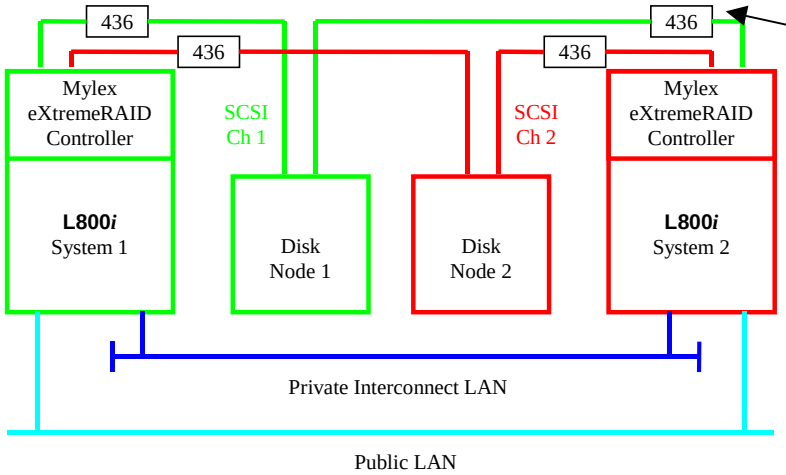
1 or 2 CPU(s) require a minimum of 128MB memory.
3 CPUs require a minimum of 192MB memory.
4 CPUs require a minimum of 256MB memory

MSCS Mylex SE Kits	What to order
MSCS Mylex SE Kit for 800i Range Servers*	SV520060
MSCS Mylex SE Upgrade Kit for 800i Range Servers#	SV520061

*If it is required to upgrade an existing rack-mount ***teamserver* L800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520060 MSCS Mylex SE kit for ***teamserver* 800** comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.



Cluster Helpers: SCSI bus extenders, also provides termination if server fails. Part of MSCS SCSI kit.

System Disk Options	What to order
4 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1” 10,000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1” 10,000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6” 10,000rpm SCA Ultra2/LVD SCSI	SV565065

One system disk required per server.
Minimum system disk size > (3 * memory) + 2GB
This is for operating system files & page file.

Disks for SE Disk Node	What to order
4 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
18GB 1.6” 7200rpm SCA Ultra2/LVD SCSI	SV565056
9GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565064

Maximum 8 x 18GB 1.6” disks in disk node.
It is recommended that all disks are the same capacity.

The Fujitsu Disk Node can contain up to eight disks.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server

Disk Node Options	What to order
Disk Node	SV657030
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

Microsoft Cluster Server on C800*i*, G800*i* and L800*i* (LVD Disk Node)

Microsoft Cluster Server (MSCS) is a built-in feature of Windows NT Server, Enterprise Edition. It is a Microsoft software product that supports the connection of two servers into a 'cluster' for higher availability and easier manageability of data and applications. MSCS can automatically detect and recover from server or application failures. It can be used to move server workload to balance utilisation and to provide for planned maintenance without downtime.

Fujitsu C800*i*/G800*i*/L800*i* MSCS Configuration

Fujitsu is offering a cost effective rack-mounted MSCS configuration based on two 800 series servers and shared disk storage that is controlled via RAID Host Bus Adapters (HBAs). Each server has a Mylex eXtremeRAID 1100 (DAC1164P) controller (with 'cluster aware' firmware) connected to two standard 800 series LVD Disk Nodes giving a maximum of 16 disks (8 per disk node). An upgrade is available that allows the addition of an extra eXtremeRAID controller in each server to which one or two additional Disk Nodes may be attached, giving a maximum of 32 disks (8 per Disk Node). These configurations provide extra resilience by using separately powered Disk Nodes that can be mirrored, with the option of redundant power supply modules as well.

PRODUCT SPECIFICATION

The products specified, ***team*server C800*i* cluster, *team*server G800*i* cluster** and ***team*server L800*i* cluster**, are configurations based on MSCS. No changes or additions have been made to MSCS - this is a Microsoft product and comes as part of Windows NT Server, Enterprise Edition 4.0.

MSCS supports fail-over on a 2-node configuration enabling recovery from common server and application failures. Clusters can be managed via an MSCS graphical administration tool. In addition, MSCS APIs are available from Microsoft to enable scaleable, cluster-aware applications to be created.

The Mylex eXtremeRAID 1100 (DAC1164P) controller has the following features:

- Ultra2/LVD speed - 2 Channels
- Up to 64MB Cache (32MB standard)
- RAID levels JBOD, 0, 1, 3, 5, 0+1, 10, 30 and 50
- Global Array Manager

RAID Levels

As stated above, RAID levels JBOD, 0, 1, 3, 5, 0+1, 10, 30 and 50 are supported. This gives flexibility in that users are not restricted to RAID 1 mirroring but can have a mixture of RAID types. However, users should be aware that (say) loss of a disk node in a non-mirrored RAID configuration could result in significant down-time while the repair takes place.

- The RAID controller groups disk drives in 'drive packs' up to a maximum of eight disks per pack.
- Each RAID array is built using a 'drive pack' and thus the maximum number of disks in an individual RAID array is 8, the minimum for each pack depends upon the RAID level – see above.
- The resulting RAID array is called a 'logical drive' and appears to Windows NT as a single disk drive that can be assigned a drive letter. The maximum number of logical drives per 2-channel eXtremeRAID controller is 32.
- To overcome the eight disk limit per disk array the RAID controller supports 'spanning'. If two disk packs of 8 x 18GB drives are defined, without spanning, the controller would present this as two separate logical drives. With spanning, although two RAIDs have been defined, they are spanned together to create a single logical drive of twice the size. Spanning also makes more efficient use of different disk capacities. If three disks of 9GB and three disks of 18GB are installed, using spanning, a single logical drive using the full capacity of all drives (81GB) can be achieved. Note the figures above do not include the overhead for redundant information. Spanning requires consecutive drive packs with the same number of disk drives and the maximum number of drive packs which can be spanned is four.
- The RAID controller supports global hot spare. Any device, which is not included in a drive pack is automatically regarded by the controller to be a global hot spare. Hot spare drive(s) must be no smaller than the largest disk in the array (for example if a two hot spares must be available to two separate RAID 1 arrays, one using 9GB and one using 18GB drives, then the hot spares should both be 18GB)
- The eXtremeRAID Controller is a *hardware* RAID device – users should not attempt to use any NT (software) RAID configurations in conjunction with this.

MSCS on Rack-mount C800*i* with LVD Disk Node

*team*server C800*i* configurations	What to order
***team*server C800*i* rack fitting kit** - Consists of rack-mounting brackets, a shelf & a front bezel	SV578110
Note that a C8x0*i* and a C800*i* rack fitting kit are both required for a rack-mount C8x0*i*	
***team*server C820*i* /Z**, 400MHz/512KB Pentium II CPU, no HDD, no RAM	SV578156
***team*server C840*iel*Z**, 450MHz/512KB Pentium III CPU, no HDD, no RAM	SV578176
***team*server C870*i* /Z**, 500MHz/512KB Pentium III CPU, no HDD, no RAM	SV578164

Two ***team*server C800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

1 or 2 CPU(s) require a minimum of 128MB memory.

MSCS Mylex Ultra2/LVD Kits	What to order
MSCS Mylex Ultra2/LVD Kit for 800i Range Servers*	SV520062
MSCS Mylex Ultra2/LVD Upgrade Kit for 800i Range Servers#	SV520063

*If it is required to upgrade an existing rack-mount ***team*server C800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520062 MSCS Mylex Ultra2/LVD kit for ***team*server** 800 comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

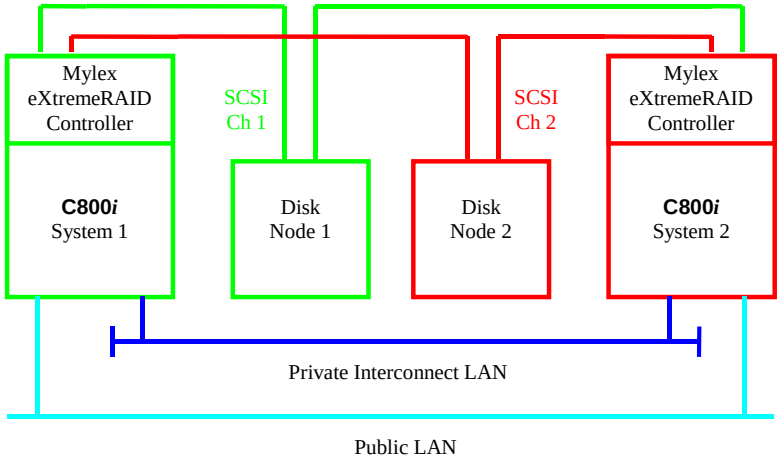
#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.

System Hot-swap Disk Options (Maximum of 3 SCA & one 3.5" disks)	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
Hot-swap Cage – can accommodate up to 3 hot-swap SCA disks (includes 3 disk carriers)	SV578097

System Fixed Disk Options (Maximum of 4 Ultra or 5 Ultra2 3.5" disks)	What to order
4 GB 1" 7200rpm 68 pin Ultra-SCSI	SV578013
9 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565066
18 GB 1" 7200rpm 68 pin Ultra2/LVD SCSI	SV565067
Up to two 3.5" disks can be installed in the 5.25" disk bays if the hot-swap cage is not used. One of the tape bays can also be used for one Ultra2/LVD 68-pin disk.	
Note: One system disk required per server. Minimum system disk size > (3 * memory) + 2GB This is for operating system files & page file.	

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server



Disks for LVD Disk Node	What to order
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1.6" 7200rpm SCA Ultra2/LVD SCSI	SV565056
18GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum 8 x 36GB 1.6" disks in disk node.
Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.

The Fujitsu LVD Disk Node can contain up to eight disks. Note that the 10k rpm SCA disks which are suitable for a Disk Node cannot be used in the **C800*i*** system.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
LVD Disk Node	SV657042
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

MSCS on Rack-mount G800*i* with LVD Disk Node

*team*server G800*i* configurations	What to order
Rack-mount *team*server G820*i* 0MB, 400MHz/512KB Pentium II CPU, LVD, no HDD, no RAM	SV661027
Rack-mount *team*server G840*ie* 0MB, 450MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV661027
Rack-mount *team*server G870*i* 0MB, 500MHz/512KB Pentium III CPU, LVD, no HDD, no RAM	SV578170
team*server G800*i* rack fitting kit –** Consists of rack-mounting brackets, replacement side panels and front bezel. It is only needed if an existing tower **G800*i is to be converted so it can be fitted in a rack.	SV578140

Two ***team*server G800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC SDRAM	What to order (64MB or 128MB DIMM as standard)
64MB	SV578093
128MB	SV578094
256MB	SV578095

1 or 2 CPU(s) require a minimum of 128MB memory.

MSCS Mylex Ultra2/LVD Kits	What to order
MSCS Mylex Ultra2/LVD Kit for 800i Range Servers*	SV520062
MSCS Mylex Ultra2/LVD Upgrade Kit for 800i Range Servers#	SV520063

*If it is required to upgrade an existing rack-mount ***team*server C800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520062 MSCS Mylex Ultra2/LVD kit for ***team*server** 800 comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

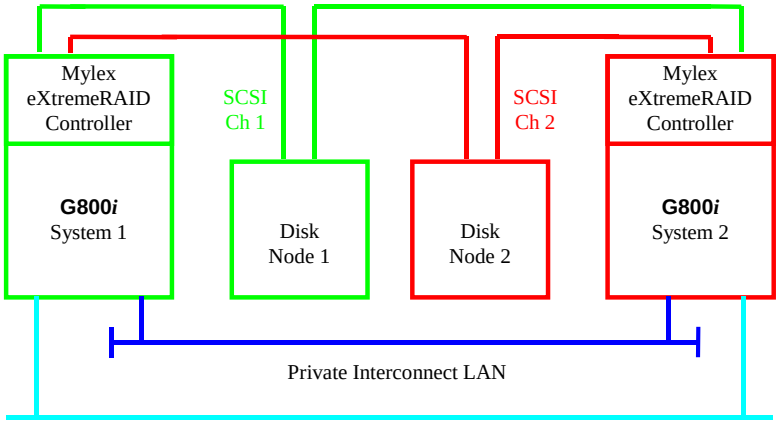
#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.

System Disk Options	What to order
4 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV642054
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

One system disk required per server.
Minimum system disk size > (3 * memory) + 2GB
This is for operating system files & page file.

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server



The Fujitsu LVD Disk Node can contain up to eight disks.

The rack-mount Disk includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Disk Node Options	What to order
LVD Disk Node	SV657042
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

Disks for LVD Disk Node	What to order
9 GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1.6" 7200rpm SCA Ultra2/LVD SCSI	SV565056
18GB 1" 7200rpm SCA Ultra2/LVD SCSI	SV565061
9GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1" 10000rpm SCA Ultra2/LVD SCSI	SV565064
36GB 1.6" 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum 8 x 36GB 1.6" disks in disk node.
Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.

MSCS on Rack-mount L800*i* with LVD Disk Node

*team*server L800*i* base configurations	What to order
Rack-mount *team*server L870*i* 0MB, 500MHz/512KB Pentium III Xeon CPU, no HDD, no RAM	SV656071
Rack-mount *team*server L880*i* 0MB, 500MHz/1MB Pentium III Xeon CPU, no HDD, no RAM	SV656072
team*server L800*i* rack fitting kit –** Consists of rack-mounting sliders, shelves and front bezel. It is only needed if an existing tower **L800*i is to be converted so that it can be fitted in a rack.	SV578140

Two ***team*server L800*i*** are required.
It is recommended that two identical servers are configured to run mission critical applications.

ECC EDO Memory	What to order
128MB RAM (4 * 32MB registered DIMM)	SV656007
256MB RAM (4 * 64MB registered DIMM)	SV656008
512MB RAM (4 * 128MB registered DIMM)	SV656009
1024MB RAM (4 * 256MB registered DIMM)	SV656010

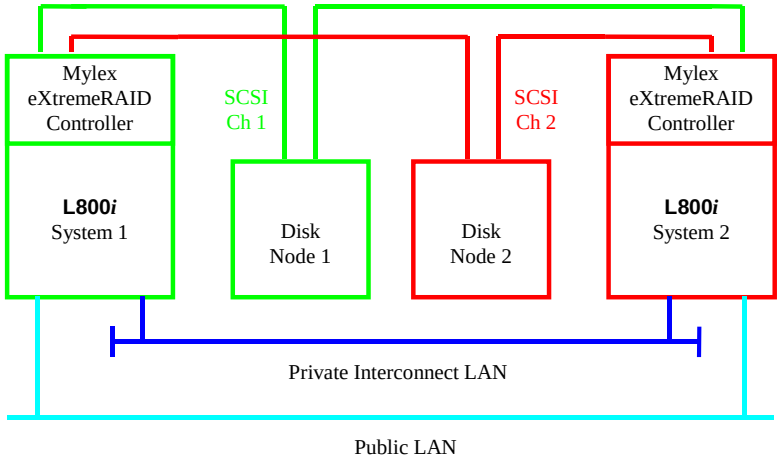
1 or 2 CPU(s) require a minimum of 128MB memory.
3 CPUs require a minimum of 192MB memory.
4 CPUs require a minimum of 256MB memory

MSCS Mylex Ultra2/LVD Kits	What to order
MSCS Mylex Ultra2/LVD Kit for 800i Range Servers*	SV520062
MSCS Mylex Ultra2/LVD Upgrade Kit for 800i Range Servers#	SV520063

*If it is required to upgrade an existing rack-mount ***team*server C800*i*** into an MSCS configuration then the MSCS Kit must be ordered (as well as an additional server).

For information, the above SV520062 MSCS Mylex Ultra2/LVD kit for ***team*server** 800 comprises:
1 of MSCS SCSI Kit – needed to cable up configuration
1 of MSCS Cluster Installation Instructions
2 of Mylex eXtremeRAID 1100 (DAC1164) Controller – one per server
2 of Intel PRO/100+ Server Adapters – for interconnect LAN

#Allows the addition of an extra Mylex eXtremeRAID controller in each server to which one or two additional disk nodes may be attached.



System Disk Options	What to order
4 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565054
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
9 GB 1” 10,000rpm SCA Ultra2/LVD SCSI	SV565063
18 GB 1” 10,000rpm SCA Ultra2/LVD SCSI	SV565064
36 GB 1.6” 10,000rpm SCA Ultra2/LVD SCSI	SV565065

One system disk required per server.
Minimum system disk size > (3 * memory) + 2GB
This is for operating system files & page file.

Disks for LVD Disk Node	What to order
9 GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565060
18GB 1.6” 7200rpm SCA Ultra2/LVD SCSI	SV565056
18GB 1” 7200rpm SCA Ultra2/LVD SCSI	SV565061
9GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565063
18GB 1” 10000rpm SCA Ultra2/LVD SCSI	SV565064
36GB 1.6” 10000rpm SCA Ultra2/LVD SCSI	SV565065

Maximum 8 x 36GB 1.6” disks in disk node.
Do not mix 10,000 and 7200 rpm disks on the same RAID controller. NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 9GB, 18GB or 36GB disks.

The Fujitsu LVD Disk Node can contain up to eight disks.

The rack-mount Disk Node includes a power supply and two fans. A redundant power supply can be added without decreasing the number of drive bays. The redundant fan is already provided.

Windows NT Server	What to order
Windows NT Server, Enterprise Edition 4.0 (including 25 Client Access Licences)	SV564085

One copy required per server

Disk Node Options	What to order
LVD Disk Node	SV657042
Redundant PSU for Disk node (Each PSU requires a separately orderable mains cable)	SV657013
Hot Swap Replacement Fan	SV578136

*team*server C7X0*i*

The ***team*server C7X0*i*** is an entry level uni-processor server family designed for use by small to medium-sized departmental workgroups, building on the success of the ***team*server C*i*** range. With the Pentium II inside, the ***team*server C7X0*i*** server systems are targeted to mid-range through high-end file & print market and low-end application server market in terms of their power and functionality.

- **Available as one model based on 300MHz Pentium II. The 300MHz comes with 512KB ECC L2 Cache.**
- **PCI and ISA bus technology for optimum performance, on-board Ultra-Wide SCSI and on-board PCI-Ethernet as standard.**
- **Contains 32MB DIMM and 4GB 5400rpm Ultra-Wide Disk Drive.**
- **Highly upgradeable and expandable - up to 512 MB ECC EDO RAM, 24GB disk space in the System Cabinet and an additional 72GB with the G-type Expansion Cabinet.**

Processor	***team*server C780*i*:** Pentium II 300 MHz with 512KB ECC integral L2 cache Intel 440FX Chipset
Memory	512MB ECC EDO Maximum from 4 DIMM slots
Memory as standard	32 MB DIMM (leaving 3 DIMM slots free)
I/O buses	• 3 x dedicated PCI slots • 2 x dedicated ISA slots
I/O subsystems as standard	• Single Channel on-board Ultra-Wide SCSI Adaptec 7880 • 10/100 Mbit PCI Ethernet on board with RJ45 connector Intel PRO 100B compatible
Storage bays	• 4 x 3. 5 inch format (one occupied by a fixed disk drive in standard configuration) • 3 x 5.25 inch format (one occupied by a CD-ROM drive in standard configuration) plus a 3.5" diskette drive
Storage in standard configuration	• 1 x 4GB 1" 68 pin 5400rpm Ultra-Wide SCSI fixed disk drive • 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
Graphics as standard	On-board 1MB PCI SVGA (ATI 264VT)
Hardware options	All options separately orderable and will be delivered unconfigured: • 4GB 1" 68 pin 5400rpm Ultra-Wide SCSI fixed disk drive • 32, 64 and 128MB RAM upgrades (DIMM) • 10/100 Mbit PCI Ethernet cards • 4/16 Mbit Token Ring card • 4–8GB (DDS-2) & 12-24GB (DDS-3) DAT Drives (internal) • 60-120GB DDS-3 DAT Stacker (external) • 7-14GB Exabyte Eliant 820 Tape Drive & 20-40GB Exabyte Mammoth Tape Drive (internal) • 20-40GB DLT4000 Tape Drive (external) • 4–8GB Tandberg SLR5 QIC Drive (internal), 1.2GB CMT Drive (external) • Mylex PCI RAID Controller • ISA SIO Asynchronous Adapter • FDDI Adapters • UK models come complete with mouse, keyboard and power cable. European and United States mains power leads must be ordered separately (not included as standard with the base server package)
Operating system software	• IntranetWare 4.11 • Windows NT Server 4.0 • SCO UnixWare 2.1.2 • WinFrame 1.7
Security	Disk bay, exchangeable bay and logic bay are all lockable BIOS controls password access and access to disks and exchangeables
Dimension & Weight	Height, Width (exc. Feet), Depth (440 x 200 x 515mm) Weight: 12kg
Expansion	***team*server G-**type expansion cabinet
Standard warranty	Contact Fujitsu Sales in your country for further details of the warranty that is offered

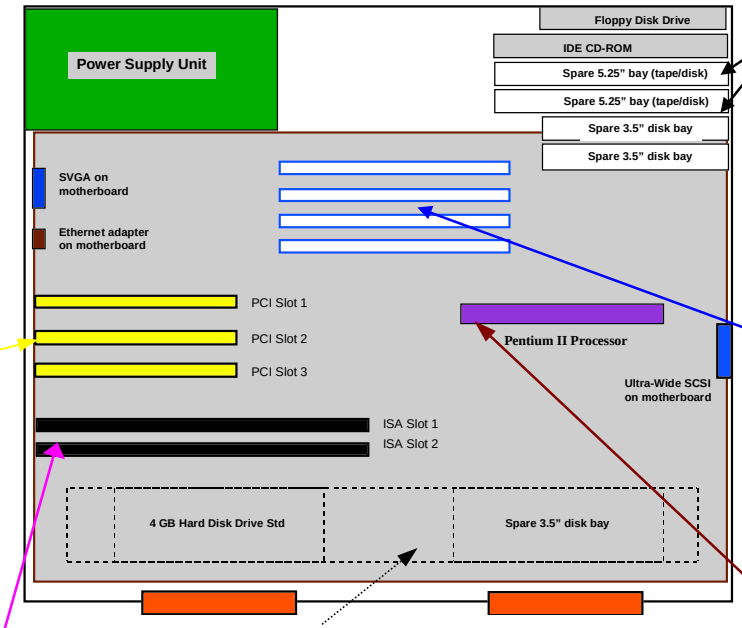
*team*server C780*i*

*team*server C7X0*i* base configurations	What to order
team*server C780*i, 300MHz Pentium II with 512KB L2 ECC Cache, 32MB DIMM, 4GB Ultra-Wide SCSI HDD, 1.44MB FDD, IDE CD-ROM, Integrated on-board 10/100Mbit PCI-Ethernet, on-board 1MB PCI SVGA, Manuals, Driver/Utility Diskettes	SV578058 (SV578059)‡

‡ UK server which includes UK keyboard, mouse and power cable

Disk Options	What to order
4 GB 1" 68 pin Ultra-Wide SCSI 5400rpm	SV578018
***team*server G-**type expansion cabinet	SV578019

*Maximum of 5 disks if one backup device is installed
#Maximum of 4 disks if two backup devices are installed
5.25" disk bay requires hard disk carrier kit SV520012



side mounted disk tray

Internal Backup Devices (Uses one bay per device)	What to order
7-14GB Exabyte Eliant 820 tape drive	SV546033
4-8GB DDS-2 4mm (DAT) tape drive	SV520009
12-24GB DDS-3 4mm (DAT) tape drive	SV546012
20-40GB Exabyte Mammoth tape drive	SV546028
4-8GB Tandberg SLR 5 QIC tape drive	SV546035
External Backup Devices	
20-40GB DLT4000 Tape Drive	SV546006
60-120GB DDS-3 DAT Stacker	SV546018
1GB Cartridge Magnetic Tape drive	SV500062

PCI I/O Adapters three from below (10/100Mbit PCI Ethernet on motherboard)	What to order
Intel EtherExpress Pro/100+ Ethernet Adapter	SV520049
PCI SE SCSI Adapter (Adaptec 2940UW)	SV521002
PCI SE SCSI Adapter (Adaptec AAA131) for RAID in System Cabinet	SV521014
PCI Mylex DAC960 PG RAID Card for RAID in **G**-type Expansion Cabinet	SV521022
PCI FDDI Adapter SAS (SK5541)*	SV631001
PCI FDDI Adapter DAS (SK5544)*	SV631002
PCI P92 WAN Adapter*	SV630002
PCI Token Ring Adapter (Olicom) (OC3137)	SV520044

* Refer to PD for operating system restrictions

ECC EDO DIMM Memory	What to order (32MB ECC EDO DIMM as standard)
32MB	SV578029
64MB	SV578030
128MB	SV578031

* Maximum of 512MB
requires removal of initial 32MB ECC/EDO Memory

Processor upgrade	What to order
***team*server** 266MHz Pentium II Upgrade	SV578028
***team*server** 300MHz Pentium II Upgrade	SV578040

ISA I/O Adapters	What to order
V.24 Synchronous Adapter Card (HSV24+)*	NP000009
ISA SIO Asynchronous Host Card (Specialix)	SV521011
Asynchronous Terminal Adapter (4 x RS-232)	SV520015
Asynchronous Terminal Adapter (8 x RS-232)	SV520016

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
UPS Base Package (220-240V)	SV537001
& UPS Kit for Operating system used	
UPS Software Kit for UNIX (SCO and UnixWare)	SV520020
(NT and NetWare in Base Package)	

Mains Lead Sets	What to order
European	57495001
UK, Asia	57495002
United States	57495004
Australia	57495005

*team*server C7X1*i*

The ***team*server C7X1*i*** is a dual capable server designed for use by small to medium-sized departmental workgroups, building on the success of the ***team*server C*i*** range. With the Pentium II inside, the ***team*server C7X1*i*** server systems are targeted to mid-range through high-end file & print market and low-end application server market in terms of their power and functionality.

The ***team*server C7X1*i*** server is available based on 266MHz Pentium II (with 512KB Cache). It is upgradeable from single to dual processor operation, thus enabling the user to meet changing workload requirements.

- **PCI and ISA bus technology for optimum performance, on-board Ultra-Wide SCSI and on-board PCI-Ethernet as standard**
- **Contains 32MB DIMM and 4GB 5400rpm Ultra-Wide Disk Drive**
- **Highly upgradeable and expandable - up to 512 MB ECC EDO RAM, 16GB disk space in the System Cabinet and an additional 72GB with the G-type Expansion Cabinet.**

Processor	• ***team*server C771*i*:** Pentium II 266 MHz with 512KB integral L2 cache Intel 440FX Chipset
Memory	512MB ECC EDO Maximum from 4 DIMM slots
Memory as standard	32 MB DIMM (leaving 3 DIMM slots free)
I/O buses	• 5 x dedicated PCI slots • 2 x dedicated ISA slots
I/O subsystems as standard	• Single Channel on-board Ultra-Wide SCSI Adaptec 7880 • 10/100 Mbit PCI Ethernet on board with RJ45 connector Intel PRO 100B compatible
Storage bays	• 2 x 3. 5 inch format (one occupied by a fixed disk drive in standard configuration) • 3 x 5.25 inch format (one occupied by a CD-ROM drive in standard configuration) plus a 3.5" diskette drive
Storage in standard configuration	• 1 x 4GB 1" 68 pin 5400rpm Ultra-Wide SCSI fixed disk drive • 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
Graphics as standard	On-board 1MB PCI SVGA (ATI 264VT)
Hardware options	All options separately orderable and will be delivered unconfigured: • 4GB 1" 68 pin 5400rpm Ultra-Wide SCSI fixed disk drive • 32, 64 and 128MB RAM upgrades (DIMM) • 10/100 Mbit PCI Ethernet cards • 4/16 Mbit Token Ring card • 4-8GB (DDS-2) & 12-24GB (DDS-3) DAT Drives (internal) • 60-120GB DDS-3 DAT Stackers (external) • 7-14GB Exabyte Eliant 820 Tape Drive & 20-40GB Exabyte Mammoth Tape Drive (internal) • 20-40GB DLT4000 Tape Drive (external) • 4-8GB Tandberg SLR5 QIC (internal), 1.2GB CMT drive (external) • Mylex PCI RAID Controller • ISA SIO Asynchronous Adapter • FDDI Adapters • UK models come complete with mouse, keyboard and power cable. European and United States mains power leads must be ordered separately (not included as standard with the base server package)
Operating system software	• IntranetWare 4.11 • Windows NT Server 4.0 • SCO UnixWare 2.1.2 • WinFrame 1.7
Security	Disk bay, exchangeable bay and logic bay are all lockable BIOS controls password access and access to disks and exchangeables
Dimensions & Weight	Height, Width (exc. Feet), Depth (440 x 200 x 515mm) Weight: 12kg
Expansion	***team*server G-**type expansion cabinet
Standard warranty	Contact Fujitsu Sales in your country for further details of the warranty that is offered

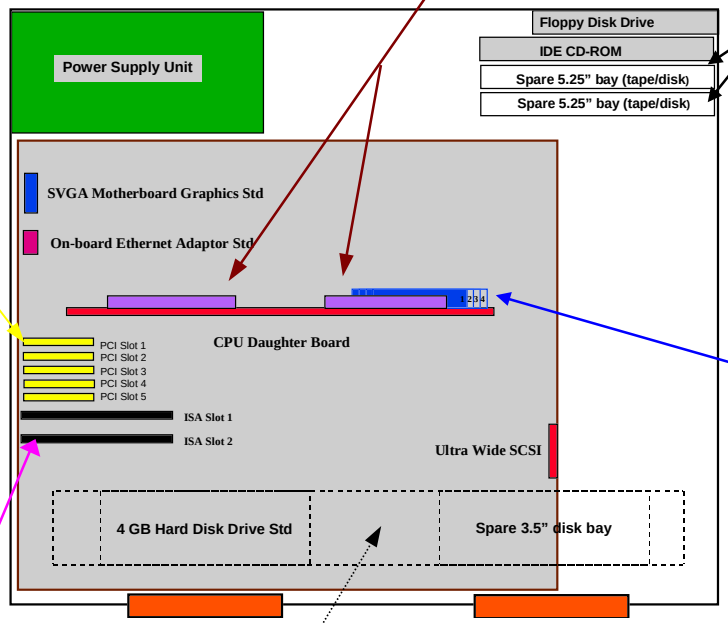
*team*server C771*i*

*team*server C7X1*i* base configurations	What to order
team*server C771*i, 266MHz Pentium II with 512KB L2 Cache, 32MB DIMM, 4GB Ultra-Wide SCSI HDD, 1.44MB FDD, IDE CD-ROM, Integrated on-board 10/100Mbit PCI-Ethernet, on-board 1MB PCI SVGA, Manuals, Driver/Utility Diskettes	SV578069 (SV578070)‡

‡ UK server which includes UK keyboard, mouse and power cable

Processor upgrades	What to order
team*server C700*i 266MHz Pentium II Upgrade	SV578028

Mains Lead Sets	What to order
European	57495001
UK, Asia	57495002
United States	57495004
Australia	57495005



side mounted disk tray

Internal Backup Devices (Uses one bay per device)	What to order
7-14GB Exabyte Eliant 820 tape drive	SV546033
4-8GB DDS-2 4mm (DAT) tape drive	SV520009
12-24GB DDS-3 4mm (DAT) tape drive	SV546012
20-40GB Exabyte Mammoth tape drive	SV546028
4-8GB Tandberg SLR 5 QIC tape drive	SV546035
External Backup Devices	
20-40GB DLT4000 tape drive	SV546006
60-120GB DDS-3 DAT Stacker	SV546018
1GB Cartridge Magnetic Tape drive	SV500062

PCI I/O Adapters three from below (10/100Mbit PCI Ethernet on motherboard)	What to order
Intel EtherExpress Pro/10+ Ethernet Adapter	SV520048
Intel EtherExpress Pro/100+ Ethernet Adapter	SV520049
PCI SE SCSI Adapter (Adaptec 2940UW)	SV521002
PCI SE SCSI Adapter (Adaptec AAA131) for RAID in System Cabinet	SV521014
PCI Mylex DAC 960 PG RAID Card for RAID in **G**-type Expansion Cabinet	SV521022
PCI FDDI Adapter SAS (SK5541)*	SV631001
PCI FDDI Adapter DAS (SK5544)*	SV631002
PCI P92 WAN Adapter*	SV630002
PCI Token Ring Adapter (Olicom) (OC3137)	SV520044

* Refer to PD for operating system restrictions

ECC EDO DIMM Memory	What to order (32MB ECC EDO DIMM as standard)
32MB	SV578029
64MB	SV578030
128MB	SV578031

* Maximum of 512MB requires removal of initial 32MB ECC EDO Memory

ISA I/O Adapters	What to order
V.24 Synchronous Adapter Card (HSV24+)*	NP000009
ISA SIO Asynchronous Host Card (Specialix)	SV521011
Asynchronous Terminal Adapter (4 x RS-232)	SV520015
Asynchronous Terminal Adapter (8 x RS-232)	SV520016

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
UPS Base Package (220-240V)	SV537001
& UPS Kit for Operating system used	
UPS Software Kit for UNIX (SCO and UnixWare)	SV520020
(NT and NetWare in Base Package)	

Disk Options	What to order
4 GB 1" 68 pin 5400rpm Ultra-Wide SCSI	SV578018
***team*server G-**type expansion cabinet	SV578019

*Maximum of 3 disks if one backup device is installed
#Maximum of 2 disks if two backup devices are installed
5.25" disk bay requires hard disk carrier kit SV520012

*team*server G700*i*

The ***team*server G700*i*** is a flexible family of servers designed for use by small to medium-sized departmental workgroups. With Intel's Pentium II inside, the ***team*server G700*i*** server systems are targeted to high-end file & print LAN servers and low-end database server market in terms of their power and functionality. All ***team*server G700*i*** server systems are upgradeable from single to dual processor operation.

- **Available as two models based on 300MHz and 333MHz Pentium II technology. Both models can be upgraded from single to dual processor operation. The 300MHz and 333MHz come with 512KB ECC Cache.**
- **PCI and ISA bus technology for optimum performance, with Ultra-Wide SCSI Backplane, dual on-board Ultra-Wide SCSI and PCI-Ethernet as standard.**
- **Contains 64MB DIMM and 4GB 7200rpm Ultra-Wide Disk Drive.**
- **Highly upgradeable and expandable - up to 512 MB ECC EDO RAM, 72 GB disk space in the System Cabinet and an additional 72GB with the G-type Expansion Cabinet.**
- **Upgradeable to Dual Redundant Power Supply.**

Processor	***team*server G780*i*:** Pentium II 300 MHz with 512KB ECC integral L2 cache ***team*server G790*i*:** Pentium II 333 MHz with 512KB ECC integral L2 cache Intel 440FX Chipset
Memory	512MB ECC EDO Maximum from 4 DIMM slots
Memory as standard	64 MB DIMM (leaving 3 DIMM slots free)
I/O buses	• 5 x dedicated PCI slots • 2 x dedicated ISA slots
I/O subsystems as standard	• Dual Channel on-board Ultra-Wide SCSI Adaptec 7880 • 10/100 Mbit PCI Ethernet on board with RJ45 connector Intel PRO 100B compatible
Storage bays	• Up to 8 hot-swap disks on Ultra-Wide SCSI Backplane • 3 x 5.25 inch format, half height externally accessible device bays (one occupied by a CD-ROM drive in standard configuration) plus a 3.5" diskette drive
Storage in standard configuration	• 1 x 4GB 1" 68 pin 7200rpm Ultra-Wide SCSI fixed disk drive • 1 x 1.44MB 3.5 inch diskette drive • 1 x IDE CD-ROM drive
Graphics as standard	On-board 1MB PCI SVGA (ATI 264VT)
Hardware options	All options separately orderable and will be delivered unconfigured: • 4GB, 9GB 1" and 18GB 1.6" 68 pin 7200rpm Ultra-Wide SCSI fixed disk drives • 32, 64 and 128MB RAM upgrades (DIMM) • 10/100 MBit PCI Ethernet cards • 4-8GB (DDS-2) & 12-24GB (DDS-3) DAT Drives (internal) • 60-120GB DDS-3 DAT Stackers (internal & external) • 7-14GB Exabyte Eliant 820 & 20-40GB Exabyte Mammoth Tape Drive (internal) • 20-40GB DLT4000 Tape Drive (internal & external) • 4-8GB Tandberg SLR5 QIC (internal), 1.2GB CMT drive (internal & external) • Mylex High Performance RAID Controller • ISA SIO Asynchronous Adapter • FDDI Adapters • UK models come complete with mouse, keyboard and power cable. European and United States mains power leads must be ordered separately (not included as standard with the base server package)
Operating system software	• IntranetWare 4.11 • Windows NT Server 4.0 • SCO UnixWare 2.1.2 • WinFrame 1.7
Security	Disk bay, exchangeable bay and logic bay are all separately lockable BIOS controls password access and access to disks and exchangeables
Dimensions & Weight	Height, Width (exc. Feet), Depth (580 x 180 x 590mm) Weight: 24kg
Expansion	***team*server G-**type expansion cabinet (maximum of 3)
Standard warranty	Contact Fujitsu Sales in your country for further details of the warranty that is offered

*team*server G780*i* and G790*i*

*team*server G700*i* base configurations	What to order
team*server G780*i, 300MHz Pentium II	SV578075 (SV578076) ‡
team*server G790*i, 333MHz Pentium II	SV578061 (SV578062) ‡
both with 512KB L2 ECC Cache, 64MB DIMM, 4GB Ultra SCSI HDD, 1.44MB FDD, IDE CD-ROM, Integrated on-board 10/100Mb PCI-Ethernet, on-board 1MB PCI SVGA, Manuals, Driver/Utility Diskettes	

‡ UK server which includes UK keyboard, mouse and power cable

*team*server G700*i* Options	What to order
Server Manager Assist	SV000037
Dual Redundant Power Supply (420w)*	SV578045

* An additional power lead is required

PCI I/O Adapters five from below (10/100MBit PCI Ethernet on motherboard)	What to order
Intel EtherExpress Pro/100+ Ethernet Adapter	SV520049
PCI SE SCSI Adapter (Adaptec 2940UW)	SV521002
PCI Differential SCSI Adapter (Adaptec 2944UW)	SV521016
PCI Mylex DAC 960 PG RAID Card	SV521022
PCI FDDI Adapter SAS (SK5541)*	SV631001
PCI FDDI Adapter DAS (SK5544)*	SV631002
PCI P92 WAN Adapter*	SV630002
PCI Token Ring Adapter (Olicom) (OC3137)	SV520044

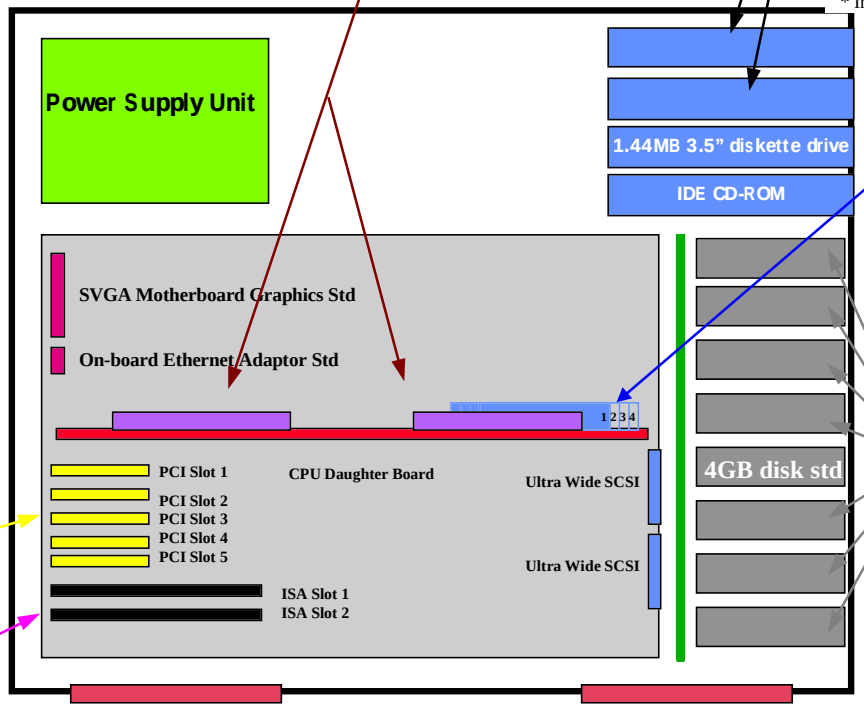
* Refer to PD for operating system restrictions

ISA I/O Adapters	What to order
V.24 Synchronous Adapter Card (HSV24+)*	NP000009
ISA Asynchronous Host Card (Specialix)	SV521011
Asynchronous Terminal Adapter (4 x RS-232)	SV520015
Asynchronous Terminal Adapter (8 x RS-232)	SV520016

* Refer to PD for operating system restrictions

Uninterrupted Power Supply products	What to order
UPS Base Package (220-240V)	SV537003
& UPS Kit for Operating system used	
UPS Software Kit for UNIX (SCO and UnixWare)	SV520020
(NT and NetWare in Base Package)	

Processor upgrades	What to order
team*server G700*i 266MHz Pentium II Upgrade	SV578028
team*server G700*i 300MHz Pentium II Upgrade	SV578040
team*server G700*i 333MHz Pentium II Upgrade (only for upgrading **G790*i*** from single to dual)	SV578060



Mains Lead Sets	What to order
European	57495001
UK, Asia	57495002
United States	57495004
Australia	57495005

Internal Backup Devices 2 from	What to order
1GB Cartridge Magnetic Tape drive	SV500008
7-14GB Exabyte Eliant 820 tape drive	SV546033
4-8GB DDS-2 4mm DAT tape drive	SV520009
12-24GB DDS-3 4mm DAT tape drive	SV546012
20-40GB Exabyte Mammoth tape drive	SV546028
4-8GB Tandberg SLR 5 QIC tape drive	SV546035
OR one Internal Backup Device from	
20-40GB DLT4000 tape drive	SV546034
60-120GB DDS-3 DAT Stacker	SV546016
External Backup Devices	
20-40GB DLT4000 tape drive	SV546006
35-70GB DLT7000 tape drive*	SV546037
60-120GB DDS-3 DAT Stacker	SV546018
1GB Cartridge Magnetic Tape drive	SV500062

* Includes SCSI cable for connection to Adaptec 2940UW

ECC EDO DIMM Memory	What to order (64MB ECC EDO DIMM as standard)
32MB	SV578029
64MB	SV578030
128 MB	SV578031

* Maximum of 512MB requires removal of initial 64MB EDO/ECC Memory

Disk Capacity Required	What to order
4 GB 1" 68 pin Ultra-Wide SCSI 7200rpm	SV578013
9 GB 1" 68 pin Ultra-Wide SCSI 7200rpm	SV565043
***team*server G-**type expansion cabinet	SV578019

The 4GB disk supplied as standard will need to be removed and replaced by a 9GB disk to achieve the maximum disk storage of 72GB in the System Cabinet.
For RAID systems, order PCI RAID Card SV521022.
NB. For RAID 5 configurations it is recommended that the disks are all of the same capacity e.g. All 4GB, 9GB or 18GB disks.

*team*server M700*i*

The ***team*server M700*i*** servers are high performance servers utilising Pentium Pro processor technology from Intel.

- Choice of single, dual, quad and 6-way Processor Models. Upgrade to triple processor model also available.
- 10/100 Mbps Ethernet and two Ultra/Wide SCSI controllers on motherboard
- 6 dedicated PCI and 4 dedicated EISA slots
- A Fujitsu-designed motherboard giving up to 4GB ECC EDO memory to maximise database performance
- Up to 9 hot swap disks in the base system cabinet, giving up to 162GB

FEATURE	M750*i*	M752*i*	M754*i*	M756*i*	M794*i*	M796*i*
Pentium Pro Processors	1 x 200MHz 512KB	2 x 200MHz 512KB	4 x 200MHz 512KB	6 x 200MHz 512KB	4 x 200MHz 1MB	6 x 200MHz 1MB
Memory (Standard)	0MB	0MB	0MB	0MB	0MB	0MB
Chip Set	Fujitsu RCC					

■ **Cache**	512KB or 1MB second-level cache per processor
■ **ECC Memory**	Maximum 4 GB DIMMs. The amount that can be used will be dependent on the Operating System. (Currently 512MB for SCO OpenServer Release 5)
■ **Disks (Internal Max)**	9 (for any restrictions on number of disks, see **PD-SR-0019**)
■ **I/O buses**	Dual bus PCI/EISA architecture 6 x dedicated PCI slots 4 x dedicated EISA slots
■ **On-board I/O subsystems**	2 x PCI-Adaptec 7880 Single-Ended Ultra SCSI controllers for Internal Connection, integrated onto motherboard. Communicates with system via the PCI bus 10/100 Mbps Fast Ethernet (Intel EtherExpress PRO/100B) for UTP (unshielded twisted-pair) cable
■ **Standard I/O Ports**	2 x Asynchronous Serial (COM) Ports 1 x Parallel (LPT) port, capable of operating in ECP or EPP modes Mouse and PS/2 Keyboard Ports
■ **Storage bays**	3 x 5¼ inch format, half-height external device bays (1 occupied by CD-ROM as fitted as standard) 1 x 3½ inch format, 1 inch height external device bay (occupied by a diskette drive)
■ **Storage in standard configuration**	1 x 1.44MB 3½-inch diskette drive 1 x SCSI-2 CD-ROM drive
■ **Server Management**	• Suite of products focused on managing server hardware remotely using the standard SNMP protocol. Integrates with existing network management systems. For more information see **PD-MW-0019**.
■ **Graphics as standard**	• SVGA PCI graphics adapter (Cirrus GD54M40, 1MB DRAM) integrated onto the motherboard
■ **Operating system software**	Operating systems supported: • SCO UnixWare 2.1.2 • Microsoft Windows NT Server 4.0 • Novell IntranetWare 4.11 † • Citrix WinFrame 1.7 † IntranetWare and OpenServer are not supported on **M756*i*** or **M796*i***
■ **Databases**	Oracle, Informix, CA-Ingres, Sybase and SQL Server
■ **Redundant Power Supply**	Two power supplies are included as standard in the base system cabinet. The Redundant Power Supply is an optional product which provides resilience in the case of failure of one of the standard PSUs. It can be hot-swapped.
■ **Standard warranty**	Contact Fujitsu Sales in your country for further details of the warranty that is offered.

Optional Hardware Accessories

■ **Memory Upgrades**	• 64, 128, 256 and 512MB RAM upgrades
■ **Processor Upgrades**	• One Pentium Pro 200MHz/512KB CPU • One Pentium Pro 200MHz/512KB CPU and one 2-CPU processor board • Two Pentium Pro 200MHz/512KB CPUs and one 2-CPU processor board • Two Pentium Pro 200MHz/512KB CPUs and two 3-CPU processor boards • Two Pentium Pro 200MHz/1MB CPUs These packages allow upgrade between single, dual, triple, quad and 6-way **M75x*i*** servers, and between **M794*i*** and **M796*i*** servers.
■ **Storage Devices**	• 4GB 1", 9GB 1" and 18GB 1.6" SCA Ultra SCSI hard disk drives • 2.6GB Magneto Optical disk (not supported on UnixWare 2.1.2) • 4-8GB DDS-2 and 12-24GB DDS-3 4mm DAT drives • 4mm DDS-3 DAT Stacker • 8mm Exabyte Eliant 820 internal Tape Drive • 8mm Exabyte 20GB internal Tape Drive (Mammoth) • DLT4000 internal and external tape drives, DLT7000 external tape drive • 1GB CMT internal and external tape drives
■ **Network Controllers**	• On-board 10/100Mbps Fast Ethernet (Intel EtherExpress PRO/100B) controller for UTP (unshielded twisted-pair) cable • Intel EtherExpress PRO/100+ PCI Ethernet Adapter (NT, IntranetWare, UnixWare) • Olicom Token-Ring PCI 16/4 Adapter (OC-3137) (NT, IntranetWare, SCO OpenServer, UnixWare) • HSV V.24 single-port WAN Adapters • P92 PCI dual-port WAN Adapter (UnixWare) • FDDI PCI Adapter: Single-Attach Station (SAS) (NT, IntranetWare, UnixWare) • FDDI PCI Adapter: Dual-Attach Station (DAS) (NT, IntranetWare, UnixWare)
■ **SCSI Controllers**	• Adaptec AHA2940UW Single-Channel Single-Ended PCI SCSI Adapter • Adaptec AHA2944UW Single-Channel Differential PCI SCSI Adapter
■ **Sync/Async Controllers**	• ISA SIO asynchronous host adapter • Specialix High Connectivity RIO RS232 Async Adapter • Intel Server Management Module
■ **RAID Controller**	• Mylex DAC960PG-2 Ultra SCSI PCI RAID Adapter (For further information refer to **PD-SR-0017**)
■ **UPS**	• APC (American Power Corporation)

*team*server M700*i*

*team*server M700*i* base configurations	What to order
team*server M750*i 1 200MHz/512KB PPro, 0MB, 0GB	SV642007
team*server M752*i 2 200MHz/512KB PPro, 0MB, 0GB	SV642009
team*server M754*i 4 200MHz/512KB PPro, 0MB, 0GB	SV642011
team*server M756*i 6 200MHz/512KB PPro, 0MB, 0GB	SV642046
team*server M794*i 4 200MHz/1MB PPro, 0MB, 0GB	SV642072
team*server M796*i 6 200MHz/1MB PPro, 0MB, 0GB	SV642073
team*server M700*i System Cabinet Redundant Power Supply	SV642018
***server*manager Assist Pro**	SV000139

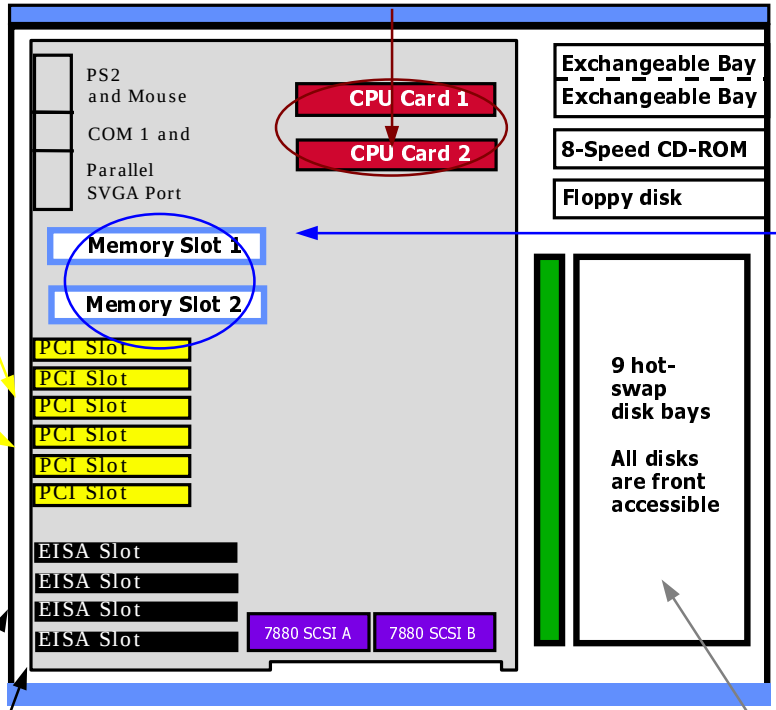
*team*server M700*i* processor upgrades	What to order
team*server M700*i 200MHz One 512KB CPU	SV642001
team*server M700*i 200MHz One 512KB CPU and one 2-CPU Board	SV642003
team*server M700*i 200MHz Two 512KB CPUs and one 2-CPU Board	SV642004
team*server M754*i to **M756*i*** upgrade: Two 512KB CPUs, two 3-CPU Boards and six heat sinks	SV642068
team*server M794*i to **M796*i*** upgrade: Two 1MB CPUs and two heat sinks	SV642069

Internal Backup Devices	What to order
1GB CMT drive	SV642057
4-8GB 4mm DDS-2 DAT drive	SV520009
12-24GB 4mm DDS-3 DAT drive	SV546012
60-120GB 4mm DDS-3 DAT stacker *	SV546016
7-14GB Exabyte Eliant 820 drive	SV546033
20-40GB Exabyte Mammoth drive	SV546028
20-40GB DLT4000 Tape Drive *	SV546034
* Full-height device and occupies both bays	

RAID

team*server M700*i supports RAID 0, 1, 0+1, 3 and 5 in the system cabinet and in the expansion cabinet. The Mylex is a dual-channel PCI adapter (same capacity disks must be used).

	What to order
Mylex DAC960 PG-2	SV521022



ECC EDO Memory	What to order
64MB Memory (2*32MB DIMMs)	SV578024
128MB Memory (2*64MB DIMMs)	SV578025
256MB Memory (2*128MB DIMMs)	SV578033
512MB Memory (2*256MB DIMMs)	SV642015
Memory Board	SV642014

Memory DIMMs can be mixed in pairs.
Maximum of 2GB per memory board.

PCI Adapters	What to order
PCI SE SCSI Adapter (Adaptec 2940UW)	SV521002
PCI Differential SCSI Adapter (Adaptec 2944UW)	SV521016
Intel EtherExpress PRO/100+ Ethernet Adapter	SV520049
Olicom Token-Ring 16/4 Adapter (OC3137)	SV520044
FDDI Adapter: Single-Attach Station (SAS) (SK5541)*	SV631001
FDDI Adapter: Dual-Attach Station (DAS) (SK5544)*	SV631002
P92 PCI dual-port WAN Adapter*	SV630002

* Refer to **PD-TS-0056** for operating system restrictions

ISA/EISA WAN Adapters	What to order
HSV24+ low-speed V.24 single-port WAN Adapter*	NP000009
* Refer to **PD-TS-0056** for operating system restrictions	

Asynchronous Adapters	What to order
ISA SIO Asynchronous Host Adapter (Max 1)	SV521011
Specialix High Connectivity RIO RS232 Async Adapter	57560057

Expansion Cabinets

Up to 12 expansion cabinets can be connected to a ***team*server M700*i***. Each one can contain up to 14 of the following disks:

4GB 1" SCA Disk (7200rpm) & carrier	SV642031
9GB 1" SCA Disk (7200rpm) & carrier	SV565051
18GB 1.6" SCA Disk (7200rpm) & carrier	SV565052

External Devices

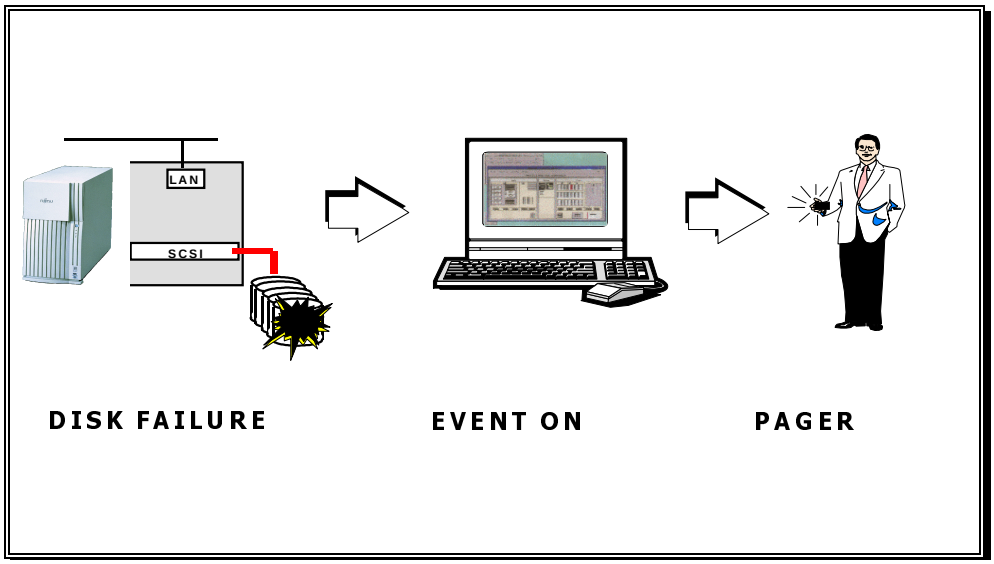
The following external devices can be connected to a ***team*server M700*i***:

1GB External CMT	SV500062
120GB 4mm Ext. DDS-3 DAT Stacker	SV546038
40GB DLT 4000 External Tape Drive	SV546006
70GB DLT 7000 External Tape Drive (includes SCSI cable for connection to 2940UW)	SV546037
SCSI cable: 2940UW to CMT/DAT	SV561009
SCSI cable: 2944UW to Exabyte	SV561001

Uninterrupted Power Supply Products	What to order
1.4 kVA UPS Base Package (220–240V)*	SV537005
2.2 kVA UPS Base Package (220–240V)*	SV537016
* 1.4kVA supports one system cabinet and one expansion cabinet, 2.2kVA supports one system cabinet and three expansion cabinets	
UPS Kit for Operating System Used	
UPS Kit for SCO OpenServer and SCO UnixWare	SV520020
Windows NT and NetWare in Base Package	

Disk	What to order
4GB 1" SCA Disk (7200rpm)	SV642023
9GB 1" SCA Disk (7200rpm)	SV565044
18GB 1.6" SCA Disk (7200rpm)	SV565048
2.6GB Magneto-Optical disk	SV545005

*server*manager



Knowing about problems before they occur or at worst as soon as they occur is key to maintaining an effective IT infrastructure. The ability to do this remotely and even when unattended is essential for today's businesses.

Effective management of a server remotely needs specific information on applications, operating systems and hardware. Application and operating system information is provided by the individual vendors, server*manager *supplies Fujitsu Computers customers with hardware specific information.

The *server*manager suite of products offers:

- **SNMP based remote information**
- **Immediate warning of both impending and actual problems**
- **Enterprise manager customisation**
- **Single point of monitoring and control via Graphical User Interface**
- **Reduced cost of ownership through remote diagnosis and centralised control**
- **Out of band access for use when the network is down or the operating system is not functioning**

Fujitsu *server***manager** software consists of the following products:

♦♦*server***manager** Software – supplied at no cost with every Fujitsu *team***server**

*server***manager Agent** - ***benefits include***

- SNMP based sub-agents which provide inventory, configuration, performance and fault management information for Fujitsu *team***servers**
- User's Guide in Acrobat and HTML formats
- Integration with HP OpenView, Novell ManageWise and CA Unicenter TNG Framework to display Fujitsu server information in an easy to understand way

Advanced *server*manager Pro Station - *benefits include*

- Familiar Windows presentation providing one GUI which can manage *team***server**s, desktops and mobiles
- Displays information provided by the SNMP software on the server
- User's Guide in Acrobat and HTML formats
- General purpose SNMP MIB Browser, Event Viewer, Statistics Viewer and Asset Manager included
- Auto-discovery of servers over IP and IPX networks
- Report generation
- Pre-set alarm thresholds
- Alert types include pager, e-mail and audio alarm

CA Unicenter® TNG™ Framework - *benefits include*

- WinNT based Enterprise management graphical user interface
- Virus detection
- Calendar management
- Report generation
- Software Development Kit available from Computer Associates
- Auto discovery of network elements
- Event capturing and management
- Customisation for Fujitsu server platforms
- Extensive range of add-on products available
- Real World Interface™ that has both 2D and 3D visual environments

♦ ♦ *server***manager Assist (C800i/G800i)** and **Assist Pro (L800i/T800i)**
– available as separately orderable products – benefits include

- Out of band access for use when the network is down or the operating system is not functioning
- Detection of hung systems, raising of an alert and optional automatic reboot (ASR)
- Online help file
- Remote reboot on demand
- Graphical user interface
- Alter BIOS settings before rebooting
- Additional features depending on platform

Server Management - Agent Facilities

	A800i	C800i	G800i	L800i	M800i
Operating System	NT/NW/UW7	NT/NW/UW7	NT/NW/UW7	NT/NW/UW7	NT/NW/UW7
Environmental					
Hardware Monitoring					
Fault Resilient Booting	N/A	Yes	Yes	Yes	Yes
ECC Memory	Yes	Yes	Yes	Yes	Yes
Chassis Fans	Not at 1st release	Yes	Yes	Yes	Yes
CPU Fan	Yes	Yes	Yes	Yes	Yes
Voltage	Yes	Yes	Yes	Yes	Yes
Cabinet Intrusion	No	Yes	Yes	Yes	Yes
Power Supply	No	Yes	Yes / Redundant	Yes / Redundant	Yes / Redundant
RAID Disks	Yes	Yes	Yes	Yes	Yes
Reporting Protocol	SNMP	SNMP	SNMP	SNMP & DMI	SNMP & DMI
Logging	OS Error Log	OS, NVRAM	OS & NVRAM	OS, NVRAM, LCD	OS, NVRAM, LCD
Server Side Actions	Not at 1st release	Yes	Yes	Yes	Yes
Servicing - FANs	No hot swap	No	Hot Swap	Hot Swap	Hot Swap
Servicing - PSUs	No hot swap	No	Hot Swap	Hot Swap	Hot Swap
Servicing - Disks	No hot swap	Optional HotSwap Cage	Hot Swap	Hot Swap	Hot Swap
Remote Control:-	No	SM assist (option)	SM assist (option)	Yes	Yes
BIOS					
SM Bios Information	Yes	Yes	Yes	Yes	Yes
Error Log	No	Yes	Yes	Yes	Yes
Operating System Monitoring					
Asset Change & History	Yes	Yes	Yes	Yes	Yes
Processor Utilisation	Yes	Yes	Yes	Yes	Yes
Filesystem Utilisation	Yes	Yes	Yes	Yes	Yes
Memory Utilisation	Yes	Yes	Yes	Yes	Yes

Server Management – Emergency Management

	SM assist option	SM assist pro option	A800i Standard Agent
Platforms Supported	C800i, G800i	G800i, L800i, M800i (NT/NW only)	A800i
Watchdog Timer	Yes	Yes	Yes
Out Of Band Availability	When watchdog detects OS failure	All the time	No OOB Available
Out Of Band Access	uses RDM daughterboard	uses IRMC2 PCI board	
OOB Features:-			
Connection	Modem only	Modem / LAN	
Power / Reset Control	Yes	Yes	
Read NVRAM Error Log	Yes		
Console Redirect	Partial - BIOS/DOS	Full - BIOS/DOS/OS	
OOB alerting	Pager	Console / Pager	

WinFrame and MetaFrame on *team*server

WinFrame

WinFrame® is a multi-user variant of Windows NT® 3.51, which allows standard PC applications to be run on a central server, yet appear to the user as if the application is running locally on the client. This gives a number of benefits, including the ability to use low-cost, low maintenance *Ergo**Win*** thin-client desktops, and much simplified administration.

WinFrame is ideally suited to delivering PC business applications cost-effectively to thin-client desktops, desktop PCs and mobile PCs regardless of where the client is located in the network.

Gartner studies have shown that the use of WinFrame with *Ergo**Win*** desktops can result in a reduction in the Total Cost of Ownership (TCO) of up to 40% compared to a traditional PC/Server environment.

Two product variants are available, *WinFrame for Terminals* and *WinFrame Enterprise.*

WinFrame Enterprise is positioned as a complete telecomputing platform for the enterprise network, satisfying a full range of requirements, from remote LAN access, to simple deployment of Windows applications to branch office sites, and manageable delivery of client/server applications anywhere in the network.

WinFrame for Terminals is designed as an entry-level method of delivering Windows applications to the desktop, and is especially suitable for small networks where most or all of the clients are *Ergo**Win*** terminals. It is far cheaper than the Enterprise version, but it excludes NT server facilities such as file & print, contains a licence for only 5 users (instead of 15), and each PC client needs a licence (with the Enterprise version, they are free).

MetaFrame

MetaFrame® is for use with Microsoft Windows NT® 4, Terminal Server Edition. Together, they provide a similar solution to *WinFrame*. *MetaFrame* adds the ICA® protocol, additional manageability, (eg session shadowing, local printing, audio support, application publishing) and load balancing (optional) to the Terminal Server Edition. *MetaFrame* enables a wide variety of clients to be able to attach to the server (DOS, Windows 3.x, MAC, Unix, Linux etc); Terminal Server Edition alone only provides access for RDP® terminals, Windows 9x or Windows NT Workstation clients.

Two other optional products are available for WinFrame/MetaFrame systems – Citrix Resource Management Services and Citrix Installation Management Services. Citrix Resource Management Services provides management tools for analyzing and tuning Citrix MetaFrame, WinFrame (1.7 and higher) and Microsoft Windows NT Server 4.0, Terminal Server Edition. The key features are audit trail, application usage analysis, capacity planning, system monitoring, alert notification and billing. Citrix Installation Management Services automates the application installation process so that applications may be quickly and easily replicated to Citrix servers across the enterprise. It provides centralised application installation for all Citrix servers on the network.

BENEFITS

WinFrame and *MetaFrame* offer numerous benefits, including :

Lower cost of maintenance : Central administration reduces the load on support staff. Use of low-maintenance *Ergo**Win*** Thin Clients reduces the traditionally high support costs of PC networks. Use of Windows NT security features prevents accidental deletion or re-configuration of applications by end users.

Lower cost of desktop upgrade :WinFrame or *MetaFrame* can be used to deliver additional applications to end-users existing desktops without the need to upgrade the desktop PCs. The application is run on the server so old 286 PCs can be used as clients.

*Lower cost of acquisition T*he use of *Ergo**Win***s can often result in a lower purchase cost than a traditional PC network.

Security : Use of Windows NT security features and the central control of applications and data can help prevent accidental and malicious damage. Also, the main server can be physically secured whilst the clients are on the shop floor, office or in a PC unfriendly environment.

Mobile access : Mobile users can access the latest versions of their corporate applications and data direct from their mobile PC. All data is secure on the central server and the user can be confident that he has the latest version of the application since everyone will be using the same centrally administered version. This is particularly useful for support and sales teams.

Scalable: By utilising the load balancing optional package a cluster of *WinFrame* or *MetaFrame* servers can be created which share the work load between themselves, giving both a degree of fault tolerance and exceptional growth potential.

Internet access : Use of secure ICA optional package allows access to the server from the internet, the secure ICA uses a very strong encryption mechanism (on top of its compression algorithm) giving low data rates of indecipherable traffic.

KEY POINTS

- Reduced cost of ownership.
- Protection of investment in existing PCs
- Simplified administration
- Improved security
- Runs most PC applications unchanged
- Looks, installs and feels just like Windows NT
- Easy software installation and upgrade - at the server only
- Low maintenance, especially if using Thin Clients
- Maximum data security (data controlled and stored centrally on the server)
- validated on the Fujitsu *team*servers

SIZING AND PERFORMANCE INFORMATION

Server sizing and performance information, giving guidelines for the number of users that can run on each server model, can be found in the Product Announcement PA-VN-0041 and in the Sales Guide SG-OS-0001.

ORDERING INFORMATION

Products 'with subscription' provide a year of software upgrades, enhancements and maintenance releases direct from Citrix Systems Inc.

	Description	Contents
SV627010	Server Option Pack for WinFrame	Software and documentation, to extend the functionality of SV627024 to include NT file/print and RAS.
SV627011	PC Client licence (1-user)	Licence only for WinFrame/MetaFrame Terminal.
SV627013	5-user additional licence for WinFrame/MetaFrame	Licence for 5 additional concurrent users
SV627014	10 user additional licence for WinFrame/MetaFrame	Licence for 10 additional concurrent users
SV627015	Load Balancing Kit for WinFrame/MetaFrame	Option pack for Load Balancing
SV627016	Secure ICA for WinFrame/MetaFrame	Option pack for secure ICA protocol.
SV627023	WinFrame Enterprise 1.8	Software, documentation, licence for 15 concurrent users, and unlimited PC and/or ErgoWin clients.
SV627024	WinFrame for Terminals 1.8	Software, documentation, and a licence for 5 concurrent users plus an unlimited number of ErgoWin clients.
SV627025	WinFrame 1.7 -> 1.8 upgrade	Software, documentation and licence for upgrade of WinFrame from 1.7 to 1.8
SV627026	MetaFrame 1.8	Software, documentation, licence for 15 concurrent users, and unlimited PC and/or ErgoWin clients.
SV627027	MetaFrame 1.8 with subscription advantage	Software, documentation, licence for 15 concurrent users, and unlimited PC and/or ErgoWin clients.
SV627028	MetaFrame Terminals 1.8	Software, documentation, and a licence for 5 concurrent users plus an unlimited number of ErgoWin clients.
SV627029	MetaFrame 1.0 -> 1.8 upgrade	Software, documentation and licence for upgrade of WinFrame from 1.0 to 1.8
SV627030	MetaFrame 1.0 -> 1.8 upgrade with subscription advantage	Software, documentation and licence for upgrade of WinFrame from 1.0 to 1.8
SV627031	WinFrame 1.7/1.8 to MetaFrame Migration	MetaFrame Software, documentation and licence for moving from a WinFrame to a MetaFrame server
SV627032	WinFrame 1.7/1.8 to MetaFrame Migration with subscription advantage	MetaFrame Software, documentation and licence for moving from a WinFrame to a MetaFrame server
SV627033	Citrix Resource Management Services 1.0	Software, documentation and licence
SV627034	Citrix Installation Management Services 1.0	Software, documentation and licence

Note: WinFrame 1.8 and MetaFrame 1.8 must be sold in conjunction with either a *team*server or appropriate terminals. It is possible to get full WinFrame Enterprise functionality by purchasing SV627024 and SV627010, plus the appropriate number of additional PC client licences. The decision between these alternatives is normally decided on price.

The Way Forward With UnixWare 7

Santa Cruz Operation (SCO), the world's No. 1 supplier of UNIX operating systems in the UNIX server market, has released their latest product UnixWare 7. Fujitsu Computers is now shipping UnixWare 7.

Why UnixWare 7?

Firstly, the name. SCO are combining UnixWare **2** and OpenServer **5** to create UnixWare **7 (5+2=7)… and then adding lots more!!**. UnixWare 7 technology will deliver to Intel customers unprecedented levels of **performance, capacity, "top to bottom" scalability and reliability**, underpinning revolutionary network computing environments and cost-effective enterprise-level solutions designed to meet the business needs for today and tomorrow.

It builds upon the next generation of open systems standards that includes the **Internet, World Wide Web, and Java** technologies, network computers and the rapid convergence in emerging technologies for computing, data communications and telecommunications. SCO believes that this confluence of technologies and standards is providing the foundation for a new wave of dramatic changes.

The benefits of this new generation of computing combines the best of both host and client/server computing, as well as adding new capabilities and benefits for customers and Information Technology managers.

Customer Benefits

- Delivers all the **friendliness** of the PC model, but uses a lower-cost and more flexible browser-based display methodology
- Highest levels of **performance, scalability, reliability and security**
- Delivers the advantages of centralised management and administration, whilst **reducing the time and cost** of accessing and managing information
- Provides **investment protection**: modernises legacy environments without starting over
- Involves a low **total cost of ownership**
- Uses the server-centric model allowing **greater flexibility**, growing as customer needs change, as opposed to having to change all the client devices to keep pace with new technology
- Best fit to business environments: "purpose-built" and "custom build" environments.

Key Characteristics of UnixWare 7

UnixWare 7 delivers a multi-functional, scaleable UNIX operating environment with tightly integrated enterprise networking services, **ideal for business critical computing**. As a superset of functionality contained in SCO OpenServer Release 5.0 and SCO UnixWare 2 systems, it adds several new technologies and enhancements to take advantage of the latest system hardware and peripherals. It has built-in support for SCO OpenServer and SCO UnixWare applications by providing **full application binary compatibility** and with the inclusion of certain key 64-bit features it is designed to provide an easy path for the forthcoming **64-bit Intel Merced** processor based UNIX systems. Localised versions of UnixWare 7 will be available later in the year.

UnixWare 7 is the best server for network computing - supports **diverse clients** (not just "Windows Everywhere" or "only Network Computers") with network install, update, replication, management, monitoring, auditing, licensing functionality and diverse client support.

UnixWare 7 is the most advanced operating system on Intel - the strongest operating system for **unprecedented performance** with Networks, Java and Database. UnixWare 7 will **be stable, reliable, scaleable, fault tolerant** and with the introduction of 64-bit architecture, will continue to be the most advanced operating system on Intel.

UnixWare 7 is the most adaptable application environment - UnixWare 7 fits well into legacy environments such as Mainframe, Microsoft NT, UNIX, LAN and WAN and integrates with all application and data types while supporting industry standards, making it the most adaptable operating system for application environments.

Convergence: the leading UNIX server - SCO is the UNIX platform of choice for the leading Enterprise OEMs. This convergence provides a high-volume of penetration through multiple channels, and allows low-end systems to remain cost-effective and easy to license.

New Technologies/Functionality

Kernel Features

Scalability and Performance Improvements (large file support; more efficient memory usage); large memory support (up to 64 GB; up to 4GB user process and rest for application data); controller hot-swap; RAS features; DDI v8; improved crash/dump.

Enterprise Reliability & Robustness

RAID and Volume Management (using SCO Online Data Manager); journaling filesystems; disk spanning; disk mirroring; multi-path I/O; fast recovery; hot-swap drives; hot-swap controllers; UPS monitoring; centralised tape backup. SCO® ARCserveIT® from Computer Associates is included with the UnixWare 7.1 Business, Departmental, Enterprise and Datacenter Edition Licences. Customers with a Base Edition Licence will need the base ARCserve licence for standard ARCserve functionality. All customers can purchase additional remote backup licences to enable backup of other server systems and also a licence to enable use of changer hardware.

Performance

UnixWare 7 on Fujitsu Teamservers has already won 1999 Hot Iron awards for best price/performance.

Integrated Internet & Intranet Services

250% better performance than UnixWare 2.1; Netscape FastTrack Server and Browser bundled; Multi-link PPP, multi homing; Java-based administration; Java run-time enabled; improved networking (TCP/Ipv6, LDAP, DHCP, DNS, ISDN); extensive modem support.

Java Directions

One of the key new technologies that enables network computing and diverse client support is Java technology. UnixWare 7 includes the **Java Development Kit** (JDK) and the Java Virtual Machine. The JDK enables the development of Java applications and applets on current and future SCO platforms.

Purpose Built Configurations

UnixWare 7 comes in several editions – Datacenter Edition, Enterprise Edition, Departmental Edition, Business Edition, Base Edition. It is also possible to custom build by adding a range of add on products to the Base Edition.

Usability

In addition to the standard UNIX desktop, UnixWare 7.1 includes new Webtop technology which enables access to any UnixWare 7 application via a browser and full security for use over the internet. A Common Desktop Environment (CDE) desktop is also available.

Easy to install and configure the latest graphics adapters and some digital audio interface for creating a high powered desktop server for graphical applications. Multi-monitor configurations supported, especially useful in technical design or financial applications. Graphics are based on X11 Release 6 XWindows system, the industry's most current XWindows standard.

The UnixWare 7 User Developer Kit (UDK) allows developers to upgrade existing UnixWare and OpenServer applications to take advantage of UnixWare 7 functionality. APIs and ABIs from both UnixWare and OpenServer are supported, and an application porting guide is included. The UDK improves developer productivity, allowing application code to be easily debugged, and source maintained and managed.

Tarantella - SCO also provide a number of advanced add-on products for UnixWare 7 to either enhance existing functionality or extend the capability of UnixWare 7 into new areas. Also released by SCO is Tarantella, which allows business critical applications on UNIX servers and mainframe-class systems to be deployed anywhere in the world to network computers and other Java clients with no rewriting.

Developed With The Future In Mind

UnixWare 7 has been designed to provide the easiest path to 64-bit, next-generation UNIX Systems for the Intel Merced processor. UnixWare 7 delivers 64-bit features such as large files and file systems, large physical memory and 64-bit ready API's. SCO has teamed up with IBM in Project Monterey to produce a merged AIX® and UnixWare product, taking the best of both to produce a Unix OS for the IA-64 platform. Project Monterey will ensure that the benefits of performance and scalability promised by 64-bit computing are delivered for the IA-64 processor. SCO and IBM already have the operating system working on a Merced simulator. The Monterey project has been joined by Sequent Computer Systems and endorsed by Compaq Computer Corporation, demonstrating that this represents THE migration path for UnixWare, OpenServer and AIX customers onto the IA-64 platform.

Upgrades

UnixWare 7 is the natural progression for UnixWare 2, OpenServer 5 and NX customers. Special trade-in products are available, enabling such customers to trade in their UnixWare 2 or OpenServer 5 licence for a Business Edition licence. To go with this, there are trade-in additional user licences and processor upgrade licences available to enable customers to match their original configuration at a reduction from the standard UnixWare 7 prices. NX customers can also avail of these favourable prices via the Hotswitch campaign. Proof of original purchase is required before licences are supplied for these products.

NetWare 5 – the Next Generation of Novell's NOS

Novell's new version of NetWare – NetWare 5 – is now available from Fujitsu Computers Limited.

Why NetWare 5?

Novell has decided that customers really understand the **NetWare** brand. It stands for a network operating system finely tuned for file, print and networking services. IntranetWare® (as used for the NetWare 4.11 version) was intended to convey the readiness for use with intranets and internets; but it has been perceived as a cumbersome name and confusing to customers. So, Novell has returned to its well-known brand name of **NetWare**.

NetWare 4 will continue to be available and supported, but some new benefits and features, such as the faster and mega-capacity new file-system, will only be made available on **NetWare 5**. [Note, that IntranetWare (NetWare 4.11) has been replaced by **NetWare 4.2** – a release which consolidates patches and simplifies product packaging of licences.

Customer Benefits

- **NetWare 5** is committed to open architecture; a Java Virtual machine environment makes it easy to add solutions
- low **total cost of ownership**;
- **NetWare 5** is a key component of several Novell solutions for providing an integrated network services solution eg NDS for Windows NT, Z.E.N.works, BorderManager, Novell Replication Services, ManageWise®.
- Year 2000 compliant
- Centralised and easier management of printers

Key Characteristics of NetWare 5

NetWare 5 is a highly specialised network services platform – tuned for fast and efficient file/print and network/web services. Initially available only in English, other European language versions will be available in Q4.

NetWare 5 further extends the utilisation of the power of **NDS** (Novell Directory Services) to improve the manageability and lower the TCO.

NetWare 5 provides excellent networking performance and services. The unique replicated directory (NDS) enables centralised templates and policies to be defined and created; it reduces the cost of ownership of managing users, desktops, printers etc. Since its first release with NetWare 4.0 in 1993, it has been refined, polished and extended to provide more and more services.

NetWare 5 integrates well into networks with application servers such as Windows NT®, UNIX; Novell even has a version of NDS which runs on Windows NT to enable its resources to be more easily managed within an NDS tree. **NetWare 5** also includes tools for managing Windows desktops, thus reducing cost of ownership

NetWare 5 will run as a Virtual machine environment in the next version of the **NetWare** platform, which will support Intel 64-bit architecture.

New Technologies/Functionality

Kernel Features

A fully pre-emptive kernel with memory protection for applications; Full multi-processing SMP architecture with a load-balancing scheduler; Virtual memory support; Source-level and remote debugger;4Gb Memory Support **NetWare 5** requires a minimum of 48Gb memory – 64Gb is preferred.

Enterprise Reliability & Robustness

Support for PCI Hot-swap drives and Hot-swap controllers; New file system technology – Novell Storage Services (NSS) – catering for maximum file size of 8 Terabytes and billions of files per volume, yet having a mount time of under 1 second, and using less memory than the original NetWare file system. For compatibility reasons, NSS cannot be used for the SYS volume.

Performance

In March 1998, as a Java Virtual Machine, **NetWare 5** was proved to be 2.5 times faster than NT and 5 times faster than Solaris via the VolanoMark benchmark tool for JVMs. NetWare 5 has received the PC World 1999 award for Best Network Operating System and 1999 Network Magazine Product of the Year - Server Operating System.

Integrated Internet & Intranet Services

Netscape FastTrack Server and Browser bundled; Pure TCP/IP, which is now the default protocol; IPX/SPX or a mixture of TCP/IP and IPX can also be used; SNMP and WAN protocols; Multi-protocol Router; NetWare Connect for remote access; DNS/DHCP services integrated with NDS for manageability

Java Directions

One of the key new technologies that enables network computing and diverse client support is Java technology. NetWare 5 includes the Java Virtual Machine, which provides an open-architecture environment and removes the need for developers to write special NLMs for a NetWare environment

TCO

NetWare 5 includes a Z.E.N.works™ starter pack, which consists of Novell Application Launcher and Workstation Manager. This enables desktop policies and applications to be defined and launched/updated centrally via the NDS tree.

Usability

Easy GUI installation. The installation process has been completely revised to enable booting from CDROM, creation of a DOS partition and a more friendly GUI interface.

ConsolOne™ is a new GUI management interface into which administration and management applications will snap-in. Being written in Java, it runs on both console and client, but at this release, the GUI administration utility is only available from the console.

Novell Distributed Print Services™ (NDPS) provides centralised management of all printers with access over IP or IPX. It implements plug and print (for an NDPS printer); drivers are automatically downloaded as required. Remote printers can be managed and access control, configuration etc is all managed via the NDS.

ADD-ON SOFTWARE

Novell provides a number of additional products which enhance the facilities provided by NetWare. ManageWise is a powerful network monitoring/management suite; BorderManager provides internet firewall and proxy services, plus a highly efficient cache which provides very fast internet access; Z.E.N.works, the full-product, provides secure remote desktop control, hardware inventory and help desk policies in addition to the facilities provided in the starter pack; Novell Replication Services® (NRS) enables replication of NetWare volumes/files across WANs.

Microsoft Windows® on *team*servers

Windows NT Server 4.0

Windows NT Server 4.0 provides an operating environment with a broad range of services and facilities. It is popular for its file & print services, communications and web services as well as being an application server. In fact, it has become a familiar work-horse in many companies today. As most companies have Windows NT or Windows 9x on their desktops, a Windows NT server provides a feeling of familiarity and commonality.

Windows NT Server 4.0 comes in several editions. The standard Windows NT Server 4.0 will run on machines with up to 4 processors; the Enterprise Edition enables up to 8 processors to be used. The facilities provided by alternate editions are described below. Windows NT Server 4.0 Client access licences are required for each client connecting to the server. Client access licences are the same for Windows NT Server 4.0, Windows NT Server 4.0 Enterprise Edition and Windows NT Server 4.0 Terminal Server Edition. Windows NT Server 4.0 Small Business Server requires client access licences specific to that product.

Key Characteristics

Feature	Description
Ease of Use and Management	
Windows® 95 User Interface	Ease of use and consistency with Windows 95 and Windows NT Workstation.
Administrative Wizards	Administrative wizards make it easier to do common administrative tasks by walking the user through the steps required for each task. Wizards included in Windows NT Server 4.0 are: • Add User Accounts • Group Management • Managing File and Folder Access • Add Printer • Add/Remove Programs • Network Client Administrator • Install New Modem • License
Microsoft Management Console	GUI Console for Administration tasks; WMI (Windows Management Instrumentation) is supported
Network Monitor	Network traffic is monitored and recorded at the packet level allowing easier troubleshooting of network problems.
System policy and user profiles	Allow system administrators to centrally manage and maintain user's desktop. • System policies are used to define standard desktop configurations, enforce behaviour and control the user's work environment and actions • User profiles contain all user-definable settings for Windows NT Users can receive the same desktop from wherever they log on.
Task Manager	An integrated tool for monitoring applications and tasks, it provides detailed information on applications or processes that are running on the Windows NT system and allows easy termination of those that are not responding.
Printer Sharing	Drivers for shared printers are located on the server allowing "point and print" automatic client installation. Remote printer folders allow easier browsing of shared printers.
S/w RAID	Striping and Mirroring of data
Diagnostics Tool	An enhanced easy to use graphical tool that displays information on device drivers, network usage and system resources. This may be run on a remote Windows NT system.
Intranet/Internet Services	
Internet Information Server 4.0 (IIS)	**Easy Web site setup and administration** • Installation integrated with Windows NT 4.0 setup • Administration of server from any Web browser • Server traffic logged to NDCS Common Log File format as well as to any ODBC database. **Good Performance** • Index Server allows content indexing and search capabilities of documents • Support HTTP byte-range enabling browsers to begin receiving data from any part of a file
Microsoft Index Server (free downloadable component)	Automatically indexes the full text and properties of files, including HTML, on Internet, Intranet or simply file-and-print servers. See Microsoft's Web site at: http://www.microsoft.com/ntserver/search/

Feature	Description
Microsoft FrontPage	Provides an easy way to create and manage professional-quality Web sites. A single user licence is delivered with Windows NT Server 4.0.
Communications Features	
Point-to-Point Tunnelling Protocol (PPTP)	Provides a way to use public data networks (for example the Internet) to create a virtual private network. Connections are via TCP/IP, but other protocols can be encapsulated and data can be encrypted for privacy. Remote access using RAS can be extended across the Internet without changing the client software.
Multi-Protocol Router (MPR)	Using this service a Windows NT Server can be deployed as a low cost LAN-LAN routing solution, eliminating the need for a dedicated router. It provides LAN-LAN routing for IPX/SPX, TCP/IP and AppleTalk®.
Dial-up	RAS and ICS (Internet Connection Services – included in Option pack) providing customisable client software, central phonebook and authentication
Telephony API 2.1	The Telephony API (TAPI) enables development of integrated computer—telephony applications.
Cryptography APIs	A set of encryption APIs that allow the development of applications that work securely over non-secure networks, such as the Internet.
Network Integration Services	
Distributed Component Object Model (DCOM).	The Component Object Model (COM) allows software developers to create component applications. Windows NT Server includes Distributed COM which extends COM to allow components to communicate across networks.
DNS Server	A version of DNS service providing a graphical administration utility and integration with WINS services for dynamic updates of host names/addresses.
FTP, DHCP	File Transfer Protocol. Dynamic Host Control Protocol enables the server to dynamically provide network settings to DHCP clients
Novell NetWare interoperability	Client and Gateway Services support NetWare Directory Services (NDS). Functionality includes resource browsing, authentication and printing under NDS. Authentication of multiple NDS trees and processing of login scripts is supported.
Windows 95 Remote Program Load (RPL)	Diskless Windows 95 clients may be booted from a Windows NT Server.
Multimedia Services	
Streaming Media Support	Windows Media Player and NetShow Services enables delivery of audio and video via Internet/Intranet

Windows NT Server 4.0 Enterprise Edition

The prime reasons for choosing the Enterprise Edition of Windows NT Server 4.0 are clustering and greater support of memory for applications. The features over and above Windows NT Server 4.0 are described below.

Feature	Description
Microsoft Cluster Server (MSCS)	Supports fail-over on a 2-cluster configuration, enabling recovery from common server and application failures. Clusters can be managed via a graphical administration tool. Also included are MSCS APIs to enable scalable, cluster-aware applications to be created. Fujitsu recommended configurations are validated via the Microsoft Clustering HCT process.
Microsoft Transaction Server (MTS)	Middleware enabling rapid creation of scalable distributed transaction applications.
Microsoft Message Queue Server (MSMQ)	Provides reliable delivery of messages across a network, even if a server is unavailable. Automatic least-cost routing , intelligent re-routing and prioritising are features. MSMQ applications can also be connected to IBM MQSeries and other messaging systems through optional gateways from Level 8 Systems.
Windows NT Load Balancing Services (free downloadable component)	Enables clustering of up to 32 machines which can service clients via a single TCP/IP address and balance the load between servers
4GB RAM Tuning	Memory-intensive applications can utilise up to 50% more RAM compared to standard Windows NT 4.0. The Windows NT kernel allocation has been reduced from 2GB to 1GB; thus enabling applications to utilise up to 3GB RAM.
Support for up to 8-way SMP	Scales smoothly from uniprocessors up to 8-way processors.

Windows NT Server 4.0 Terminal Server Edition

Windows NT Server 4.0, Terminal Server Edition is a version of Windows NT 4.0 which includes the Citrix MultiWin® technology. This enables Windows-based desktop applications to run unchanged on the server and be accessed, if required, via a thin-client. Microsoft's Remote Desktop Protocol (RDP) is used to transfer keystrokes and screen changes efficiently between a Windows CE Windows Terminal, Windows NT Workstation or Windows 9x desktop. Citrix Systems supply an enhancement to this system – MetaFrame – which allows many other types of terminals to connect to a Windows Terminal Server and provides additional management/usability features.

This edition is offered pre-installed on selected teamservers. In addition to the standard client access licence, each client requires either a Terminal Server Client Access Licence or a Windows NT 4.0 Workstation licence.

Microsoft BackOffice, Small Business Server

Microsoft BackOffice, Small Business Server 4.5 is a version configured for the needs of small businesses. It consists of Windows NT Server 4.0 and BackOffice components and can be licensed for up to 50 users. The following features are in addition to the standard Windows NT Server 4.0 with Service Pack 4.

Feature	Description
Microsoft SQL Server™7.0	Provides a powerful, secure relational database for running business applications. Users can create an unlimited number of SQL Server 7.0 databases with a limit of 10GB per database.
Microsoft Exchange Server 5.5	An Internet mail and collaberation server that includes business solutions to help get customers connected and co-ordinated.
Microsoft Outlook® 2000	A desktop information manager that helps users manage their messages, appointments, contacts and tasks, as well as track activities, open and view documents and share information.
Microsoft Fax Service	Enables users to fax from their desktops and manage incoming faxes centrally.
Microsoft Modem Sharing Service	Allows small businesses to share modems installed on the server. Reduces waiting time for connections because the server automatically uses the next available modem in the pool to handle dial-in or dial-out requests.
Small Business Server Internet Connection Wizard	Configures Small Business server for automatic or manual setup with an ISP using a variety of internet connections. Automatically configures Proxy firewall capabilities and Exchange email capabilities.
Small Business Server Console	Easy-to-use console for administration tasks.

Microsoft BackOffice Small Business Server is supplied pre-installed on selected teamservers.

Networking for UnixWare

The Networking products are a comprehensive set of products to support the connection of a UNIX Server to Wide Area Network (WAN) or a Local Area Network (LAN). LAN connection is over both OSI Networks and TCP/IP networks

The OSI products add reliable, scaleable Open Systems communications facilities that enable a UNIX server to interwork with OSI systems from ICL, FUJITSU and OEMs over X.25 Wide Area Networks, OSI Local Area Networks or TCP/IP networks.

The products are packaged on a CD-ROM and activated by licence key. The following Operating Systems and platforms are supported:

CD-ROM	*Operating System*	*Platform*	*Product Announcement*
NP000003	SCO UnixWare 2	Intel *team***server**	PA-SD-1192

SCO UnixWare 2 and UnixWare 7

Networking Facilities

OSI for X.25 WAN offers ISO Transport services over X.25 Wide Area Networking supporting V.24 and X.21, together with Host and Terminal PAD, OSI Higher Layers Services, and configuration tools.

OSI for LAN offers ISO Transport services over Ethernet, FDDI and Token Ring Local Area Networks, together with Host and Terminal PAD, OSI Higher Layers Services, and configuration tools.

OSI for TCP/IP offers ISO Transport over TCP/IP networking for Ethernet, FDDI and Token Ring Local Area Networks, and OSI Higher Layers Services, with Configuration tools.

Open Transport Relay (OTR) Version 3 is a UNIX based software product which allows distributed applications to interwork transparently over TCP/IP, OSI for LAN, OSI for X.25 WAN and OSI over TCP/IP networks.

Networking Adapters

FDDI : A DAS adapter for connection to a resilient FDDI dual ring.

Fast Ethernet : The Intel 10/100 MBit PCI Ethernet Pro100+ adapter is available.

Token Ring : The Olicom PCI Token Ring Adapter (OC-3137) is available.

P92 WAN adapter : Dual port V.24 and X.21 operating at speeds up to 2Mbps.

Networking Applications

FTAM provides ISO File Transfer, Access and Management facilities that enable files to be transferred to/from other systems from ICL, FUJITSU and OEMs over both OSI or TCP/IP networks. The product includes support for UNIX terminal interface, batch commands for building into UNIX scripts and the X-Open BSFT interface. The OSI FTAM Recovery & Restart facilities are also provided enabling FTAM to be used as a comprehensive application for software distribution, statistics collection, stock control and so on.

The **IPA Networking Facilities** are widely used on UNIX and ICL Mainframe systems. The products announced are based on the NX IPA products and when used with **OSI for LAN** or **OSI for X.25 WAN** they provide the full spectrum of IPA facilities over LAN or WAN.

- **FTF** allows files to be transferred to and from other systems using the Information Processing Architecture (IPA) standard Network Independent File Transfer Protocol (NIFTP).

- **Interactive Video** allows workstations on the UNIX server to communicate with ICL VME mainframe applications and services in Full Video Mode.

- **Interactive Video (KE)** allows workstations on the UnixWare2.0 Application Server systems to communicate with ICL VME mainframe applications and services in Full Video Mode. This product will also support Function key Mapping but it supports fewer terminal types and connection modes than **Interactive Video**.

- **Direct Print** allows ICL VME mainframe applications and services to route data to the UNIX server connected printer spooler or file.

- **DP Primary** supports the transmission of documents from the UNIX server to a remote system which supports ICL VME standard secondary interface for remote printers, ICAW-02 Variant 5.

- **ADI** is part of ICL VME Information Processing Architecture (IPA). The ADI product allows programs in the UNIX server to communicate with programs using ADI in other systems in the same communications network.

Overview of RAID

What is RAID?

One of the most popular server requirements is RAID, an acronym for Redundant Array of Independent (or Inexpensive) Disks. The key concept in RAID is this: a single disk failure does not bring your system down, because you can recreate the lost data from parity information stored on the other disks. Today RAID addresses three needs:

Fault Tolerance: today's applications typically require 100% up time.

Scalability: the ever-increasing requirement for more resilient storage capacity.

Performance: more simultaneous reads/writes, or faster data transfer.

The RAID Levels:

In 1987, three University of California researchers outlined the original RAID classifications. Their papers sparked interest in disk arrays by end-users and storage vendors, and untangled a wide variety of thorny design issues. The RAID levels they outlined are as follows:

RAID Functional Description Table

RAID 0 Called striping. The data is broken up into chunks as it is written across all the drives. This provides the highest performance but no redundancy is provided. Strictly speaking the absence of redundancy in a striped array makes the term RAID a misnomer.

RAID 1 Called mirroring. The data is written redundantly to pairs of drives and can be read independently from each drive. This is fast and provides full redundancy but twice the needed disk capacity is required.

RAID 2 The data is bit-interleaved across groups of drives with some of the drives storing error correction codes. This provides full redundancy and more error correction capability, but is often slow due to the hardware overhead.

RAID 3 The data is byte-interleaved across groups of drives with only one drive dedicated to storing parity. This provides full redundancy and high transfer rates when large blocks of data are transmitted. This is best for high bandwidth applications.

RAID 4 The data is broken up into chunks and written across the drives with one drive dedicated to parity. This provides full redundancy but the single parity drive causes a bottleneck when the parity must be updated.

RAID 5 The data is broken up into chunks and written across the drives. The parity for the stripes of data is also spread across all the drives so no one drive is dedicated to parity. The operating system sees the group of physical disks as one disk drive. This is the best for transaction processing, where many small I/Os are required.

There are other types of RAID such as RAID 6, RAID 7, RAID 1+0 and RAID 3+5. These are hybrids of the original RAID levels described above. e.g.

RAID 10 Striping of two RAID 1 arrays.

RAID 30 Striping of two RAID 3 arrays.

RAID 50 Striping of two RAID 5 arrays.

Which is the Right RAID Level?

The answer, of course, is it depends on the application. RAID-3 offers high transfer rates and is ideal for large blocks of data where speed is of importance. Computer Aided Design, Graphics, Scientific Computing, Image and Multimedia applications are all good examples.

RAID-5 arrays offer high I/O transaction rates for small transfers and is ideal for on-line transaction processing (OLTP) applications, such as for banks, insurance companies, hospitals, and some office environments. These systems typically perform large numbers of concurrent requests, each of which makes a small number of disk accesses. A minimum of 3 disks is required for RAID-5 and up to 1 disk in 8 will be redundant. e.g. 18GB useable disk space requires 3 x 9GB disks, 63GB useable disk space requires 8 x 9GB disk drives.

It is important to understand that RAID is a performance / resilience trade off. Few users seem to understand this and it is common place to find systems where the entire database workload has been implemented on a single RAID 5 filesystem and then wonder why the system is slow. On RAID 5, write performance can be 2 to 3 times slower than RAID 0 or 1. On a well tuned database system, the performance of the system is often governed by the speed of the database logs which consist primarily of sequential writes. Hence, it is not generally a good idea to put a complete database system on a single RAID 5 filesystem.

Benefits and Limitations of most popular RAID Levels

RAID Level	Benefits	Limitations
0	Maximum data capacity. High read and write performance.	No fault tolerance or redundancy.
1	100% data redundancy.	Usable capacity reduced by 50%. Requires 2 disk drives.
3	Optimised for applications which transfer large files sequentially. Low cost fault tolerance.	Not suitable for smaller random data access. Requires a minimum of 3 drives.
5	Advantages of striping with low cost fault tolerance. Balanced performance and cost for smaller random data access.	Slower write performance than RAID 0 or 1. Requires a minimum of 3 drives.

RAID Controllers for *team*server

Two PCI RAID controllers are offered on Fujitsu ***team*server** systems.

The Mylex AcceleRAID 250 RAID Adapter with 8MB cache (max 128MB) (SV521033) is available on **C800*i*** and supports RAID levels 0, 1, 3, 5, 10, 30, 50, 0+1 and JBOD. The Mylex eXtremeRAID 1100, 2 channel controller with 32MB SDRAM cache (max 64MB), with battery (SV521036) is available on **C800*i*** (not for internal disks)**, G800*i*, L800*i* and T800*i*** and supports RAID levels 0, 1, 3, 5, 10, 30, 50, 0+1 and JBOD.

Software RAID

Software-based RAID implementations are either operating system-based, or they are application programs that run on the server. Array operations and management functions are controlled by the array software running on the host CPU.

UnixWare 7 provides RAID levels 0, 1, 5 & 10 through an additional software package called Online Data Manager. NT Server provides RAID levels 0, 1 & 5 (RAID 5 is referred to as striped set with parity) as part of the operating system. IntranetWare provides RAID levels 0 & 1 as part of the operating system.

Just like any other application, software-based arrays occupy host system memory, consume CPU cycles and are operating system dependent. By contending with other applications that are running concurrently for host CPU cycles and memory, software-based arrays degrade overall server performance. Also, unlike hardware-based arrays, the performance of a software-based array is directly dependent on server CPU performance and load.

10 Steps To Resilience

Resilience is a way of virtually eliminating unexpected system downtime. It consists of a combination of redundancy, availability and manageability features. Complete resilience leads to a system which is always running, 100% of the time. One definition of resilience in a Business Computing Environment:

Maximising system tolerance to any failure ***[and]*** providing the highest level of system uptime.

A server either serves a number of people or is involved in supporting mission critical operations. It is therefore necessary to consider the implications of the server failing. In an ideal world, the server should never fail. The quality of components used by vendors and the level of quality testing the vendor performs is crucially important.

However if a component should fail it should be ensured that there is no data loss and that the system can be brought back up and running as soon as possible with minimal disruption to the users.

Resilience is an important aspect to the Fujitsu server range, and begins at the design stage. A major share of the company's huge R&D budget has been invested in creating world class technology, which is capable of meeting the ever-increasing demands of the real world.

This lies at the core of Fujitsu's "10 steps to resilience".

Each additional 'step' builds up the solid foundation of the previous layers:

Prevent Component Failure

1. Component reliability and investment in underlying technology - stringent quality criteria are applied to the selection of all Fujitsu's server components.

2. Reliability through design, validation and testing - rigorous testing procedures are applied to the system, operating system and environment as well as the manufacturing process.

3. Fujitsu Software Partnerships - alliances with the world's leading software technology companies - such as Microsoft, SCO, Novell, SAP and Citrix - enable Fujitsu to bring the best platform technology to its customers, with compatibility pre-certified by the software vendor.

4. Server Management – analysing the status of the server, disk usage, processor temperature etc., allowing pre-failure problems to be dealt with before they might cause a failure.

These four steps are built in at no extra cost, all focussed on minimising the chance of a component failure.

Prevent System Failure

5. Redundancy against data loss – saving your business by duplicating your critical business data against loss or corruption e.g. ECC memory, RAID disks.

6. Redundant components (extra) – ensuring your server continues to service your users/customers even if a component should fail, e.g. disks, ECC memory, LAN Card, fans, PSU.

7. Uninterruptible Power Supplies (UPS) – protecting your server if a power cut occurs or someone accidentally pulls out the wrong plug; the UPS will kick in to keep the server running. The UPS also smoothes out any "spikes" in the mains power to prevent any harm to your server.

Zero Down-time

8. Hot-swap/spare components – replacing failed (redundant) components without impacting your user/customer service i.e. zero downtime, by using hot-swap:- disks, fans and PSUs. Risk can be reduced even further by stopping the chance that two component failures might bring the service down. The server automatically configures the hot-spare to replace a failed component e.g. hot-spare redundant disk.

Manage Failure

9. Automatic Server Recovery – often under-rated, it constantly monitors whether the operating system is alive and running. Once it is sure the O/S has hung it automatically re-boots the system.

10. Availability Clusters – consists of two servers where the applications on one server can be moved across to the other, either manually if you want to upgrade one of the servers or automatically in the event of a component failure where the component is a single point of failure.

All of this adds up to ... **Maximum System Resilience**

Reliability – not many companies quote their reliability data, but this is where Fujitsu is different. Fujitsu is committed to providing the most reliable products possible. The latest statistics show the teamserver Ci only experiences one incident every 9.0 years and this is before the advantage of redundancy!

In addition our factories implement a "licence to build", a rigorous training programme that ALL manufacturing employees have to pass in order to build Fujitsu products, followed by continuous spot checks.

Fujitsu reliability

Hardware availability figures based upon 4 hour call to fix/replace and Fujitsu hardware warranty statistics (Nov 98 – Jan 99)

Ci	99.995% hardware availability (avg)	- 1 incident every 9.0 years
Gi	99.987% hardware availability (avg)	- 1 incident every 3.4 years
Mi	99.978% hardware availability (avg)	- 1 incident every 2.0 years

The reliability figures quoted are in fact the worse case scenario, as no allowance is made for using redundant or hot-swap/spare components. With these features incorporated the reliability figures would be even better.

Of course, as servers get larger they contain more system components (e.g. disks) so the component failure rate per system will increase. But the larger the system, the greater the impact there may be to the user's business. So redundancy coupled with hot-swap and hot-spare components become increasingly important as systems become larger.

Manageability

While RAID, clustering, and other sophisticated features can provide a safety net should the unthinkable happen, it would be much better if you could know about it *before* it happens, and so take corrective action.

Manageability provides an unprecedented level of control over systems - so much so that all the many elements can be administered remotely and faults can often be identified before they occur.

Fujitsu *server*manager

Today's systems are not getting any less complicated, and neither is their workload. Which makes it all the more essential to manage these machines effectively.

This is where Fujitsu's ***server*manager** can help. It comprises a powerful set of tools, based around a Windows-style interface, and delivers intelligent and reliable monitoring, alerting, remote maintenance and control of servers on the network.

Fujitsu provides all of this free. Fujitsu takes the view that manageability is not a luxury, but an essential and integral part of any server.

As a result, the MIS department can keep track of its hardware assets, such as disks, cabinets and I/O cards and will have a record of the configurations used. They can monitor the demands placed on the system, and whether it has the resources to cope. And they will be kept informed of fan status and temperature, providing an opportunity to identify and correct any problems that arise.

All of this can be achieved remotely, via a LAN or WAN or even via a modem, using an optional extra known as ***server*manager Assist**.

The benefits can be considerable, with an opportunity to reduce maintenance costs while increasing the productivity of users.

Data Redundancy - Lose the data or get corrupt data and the whole business might be in ruins. Data redundancy is the most important form of redundancy to have. Therefore best practice organisations regularly back up their data.

To ensure the very latest data is protected one further step is needed. Redundancy of live data, whether on disk or in memory. The two most important forms of data redundancy are:

- Error Checking and Correction memory (ECC)
- Disk data redundancy - RAID

Both will correct the failure on the fly without impacting the server application or users.

Redundant Components - Component redundancy is where a failure may happen, but the server will remain operational as other duplicate components can keep the system running. However, the system will have to be taken down to make the repair necessary to the affected component. This will probably be managed downtime. It may be a mistake to wait too long as a further failure to the same type of component could cause the whole system to fail. Some examples of redundant components are disks (coupled with RAID), fans, power supply units (PSU), and LAN cards.

Hot-swap, redundant components – This is where a repair can take place whilst the system is still running, resulting in zero downtime. Just pull out a failed disk while the system is running, and replace it with a new disk. The system automatically rebuilds the original data using information from other disks in the system. Hot-swap means no impact on users, and no downtime.

Hot-spare components – If another disk should fail before the first disk has been swapped out then there would be a disaster. A hot-spare disk can automatically cut in if any other disk fails.

What is RAID? (see also **Overview of RAID**)

The loss of the use of a server is one thing, the loss of the data it contains is quite another and one that the modern, competitive organisation is not prepared to contemplate. One way to minimise the risk is through RAID, or Redundant Array of Independent Disks. RAID is a key element in supporting hot-swap and hot-spare disks.

In simple terms, RAID ensures that should a disk fail, for whatever reason, other disks are standing by to recreate the lost data, and to guarantee a seamless operation. Many different 'levels' of RAID are available, and choosing the right level requires a trade-off between resilience and performance.

However, RAID isn't just concerned with maximum fault tolerance. Today, RAID also addresses other priorities for the corporate IT user. For example, it meets the need for scalability by offering a substantially increased level of storage capacity up to nearly 3TB currently, which is also highly resilient. It is also designed to achieve a high level of performance through increased simultaneous reads/writes and faster data transfer.

Clusters – Despite all the best efforts to reduce the risk of failure, if a system does fail, either because redundancy is not available, or because a failure occurs on another component, then the work being performed by that server is transferred to another server, resulting in minimal downtime whilst the application is being transferred.

Clustering used to be widely used in the database application area, but the increasing need for around-the-clock availability has seen the technique expand into new areas - most notably for Internet and email servers, helping to support the need for access at every hour of the day and night.

Clusters can also be used to allow upgrades or maintenance to be carried out on one of the servers at a time of your choosing.

Automatic Server Recovery (ASR) - If a server experiences a failure where the system 'hangs' (e.g. operating system), automatic server recovery will take place to re-boot the system and restart the operating system and applications. This is particularly useful when the system is unattended, i.e. in the middle of the night or at a location where there is no on-site maintenance. There will be a short period in downtime whilst the system reboots.

The **A800*i***, **L800*i*** and **T800*i*** support ASR whilst the **C800*i*** and **G800*i*** support ASR if the Server Manager Assist card is configured. ASR is turned off by default and can be activated by installing *server***manager** and then using the management software to turn ASR on.

Competitive Information

The following table has been put together to show how Fujitsu 800 Series Servers compare with competitive models from Compaq, HP, DELL, IBM and Siemens. The comparisons are made on the basis of features and excludes pricing information.

In certain comparisons, where the competition do not have an exactly comparable box, the closest model based on features has been chosen. In other situations, where the competition have models which bracket the Fujitsu model, both competitive models are displayed. This is most applicable to Compaq with the ProLiant 1600 and the ProLiant 800.

The information has been derived from the Competitors' web sites.
Nomenclature may vary because the information was only available in that format, for example, peripheral bays.

More detailed information can be downloaded from: http://www.fujitsu-computers.com/Servers/CA/CATS9001/CATS9001.XLS

Competitive Server Information Overview

	FUJITSU	COMPAQ	DELL	HP	IBM	SIEMENS
ENTRY LEVEL	**A800i**	ProSignia 720 ProLiant 400	PowerEdge 1300	NetServer E60	Netfinity 1000, 3000	Primergy 070, 170, 270
WORKGROUP	**C800i**	ProSignia 740 ProLiant 1600, 1850R (800)	PowerEdge 1300 (2300)	NetServer LC3, LPr (E60)	Netfinity 3500 M10	Primergy 470
DEPARTMENTAL	**G800i**	ProLiant 3000 (1600)	PowerEdge (2300) 4300, 4350	NetServer LH3	Netfinity 5000, 5500	Primergy 470, 670-20
ENTERPRISE	**L800i**	ProLiant 5500, 6500, 6400R	PowerEdge 6300, 6350	NetServer LH4	Netfinity (5500 M10) 5500 M20	Primergy 670-40, 870 Edition, N70-40
DATACENTRE	**L800i**	ProLiant 6000, 7000		NetServer LXr 8000	Netfinity 7000 M10	Primergy 870-40
DATACENTRE	**T800i**	ProLiant 8000, 8500	PowerEdge 8450	NetServer LXr 8500	Netfinity 8500R	Primergy 870-80

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